THE IRON AGE

New York, Thursday, May 31, 1906.

Motor Drive in the Firth-Sterling Steel Company's Plant.

The development of high speed tool steels has been a most active influence toward the more extended use of electric motors for driving machine tools. A very few years ago, when high carbon tool steel was in general use, a cutting speed of 12 feet per minute was a fair average, and mechanical speed changing devices filled the requirements. As cutting speeds increased with the introduction of Mushet and air hardening, tool steel requirements became more severe, until with the advent of high speed steel it was found necessary to install heavier machinery to turn out the increased output possible with increased cutting speeds. The problem of transmitting power then became more important, as belts were more wasteful and costly with higher speeds and increased power demands; and further, the time and labor of shifting heavy belts on cone pulleys seriously hindered the efficient operation of machines. The logical remedy was the individual driving of machine tools by electric motors. Then came the problem of reliably and efficiently controlling the speed of the motor. With cutting speeds increased to about 50 feet for roughing cuts on steel and from 85 to 125 feet per minute for finishing cuts, perfect control of the motor was demanded, so that with each change of diameter of the work the rotating speed could be varied.

To meet the demands of such service the Westinghouse Electric & Mfg. Company developed a line of direct current motors, known as the type SA, with a speed range of 4 to 1 on a single voltage, the control being obtained by resistance in the shunt field circuit. Both mechanically and electrically the type SA motors are identical in construction with the company's type S motors, except for the addition of auxiliary poles and coils for controlling the field form during the variation of field strength with changing speeds. This motor was described in *The Iron Age* March 8, 1906. The application of the SA motors to machine tool drive obviates the use of mechanical speed changing devices, and places each machine under perfect control of the operator, with a fuller range of speeds than can be obtained by mechanical methods.

The practical application of the SA motors is illustrated by a typical installation in the new projectile shop of the Firth-Sterling Steel Company, at Demmler, Pa. The equipment consists of eight 10 horse-power motors, each driving a 26-inch Bullard lathe, one being shown in Fig. 1; two 15 horse-power motors, each driving a Bullard horizontal boring machine, one being shown in Fig. 2, and one 7½ horse-power motor direct connected to a Bullard turret lathe. The speed of the motors is varied by controllers giving 21 motor speeds. In addition to the SA motors there is a 35 horse-power type S constant speed motor belted to a line shaft, which furnishes power to a group of small machines, including a planer, cutting-off machine, centering machine and two drill presses.

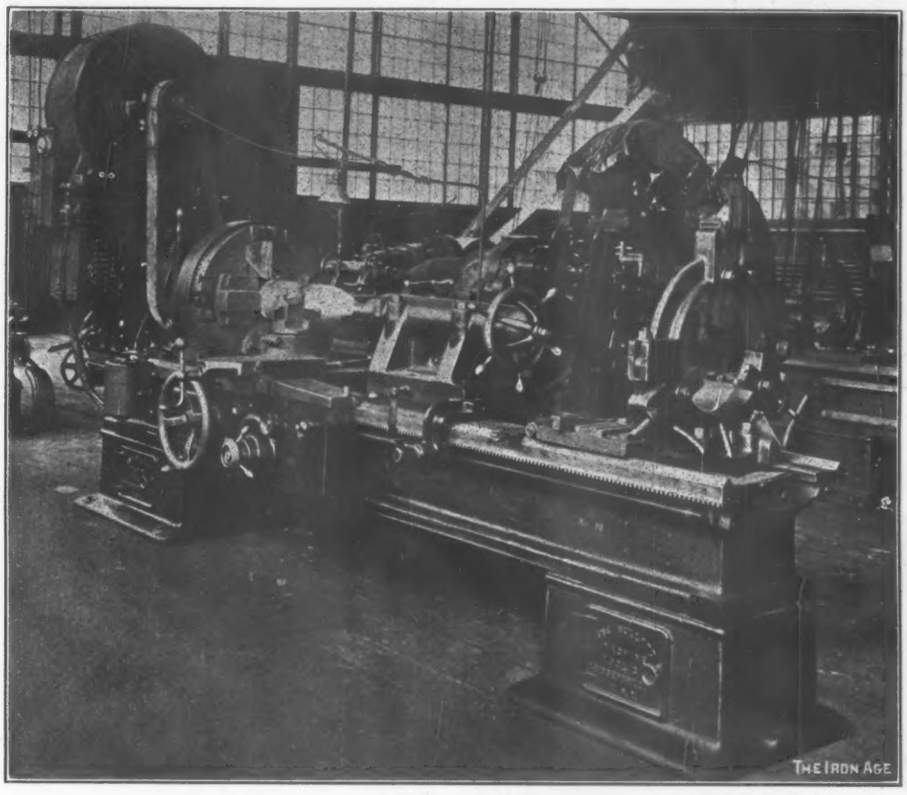


Fig. 1.—Motor Driven Projectile Turning Lathe in the Firth-Sterling Steel Company's Plant.

By following the various steps in the manufacture of projectiles the adaptability of variable speed motors to this class of work is clearly apparent. The motor driven machines, however, are not confined to such work in the Firth-Sterling plant, as various kinds of machine products are turned out as well, the wide range of speed and ease of control being especially adapted to the testing of high speed tool steel.

A novel method of checking the efficiency of employees has been introduced, which is made possible by the use of electric drive. It consists of placing in a convenient location a recording ammeter, arranged to be connected in circuit with any machine whenever desired. Previous tests have determined approximately the current required for a given class of work, so that the record of the am-

meter indicates whether or not the machine is working up to its capacity and the time it stands idle.

By referring to the illustrations a good idea of the appearance of projectiles in the different stages of manufacture can be gained. The first step is the making of a steel casting similar in form to the finished projectile, but somewhat larger in diameter. After the metal has congealed it is removed from the mold and allowed to cool. The casting is then heated to a forging temperature and forged by a Bement-Miles steam hammer, when, after cooling, it is again brought to a red heat, placed in a receptacle, covered with lime and allowed to remain until entirely cool, the length of time depending on the size of the forging. This is known as the annealing process, and leaves the projectile in the condition shown at the left in Fig. 3.

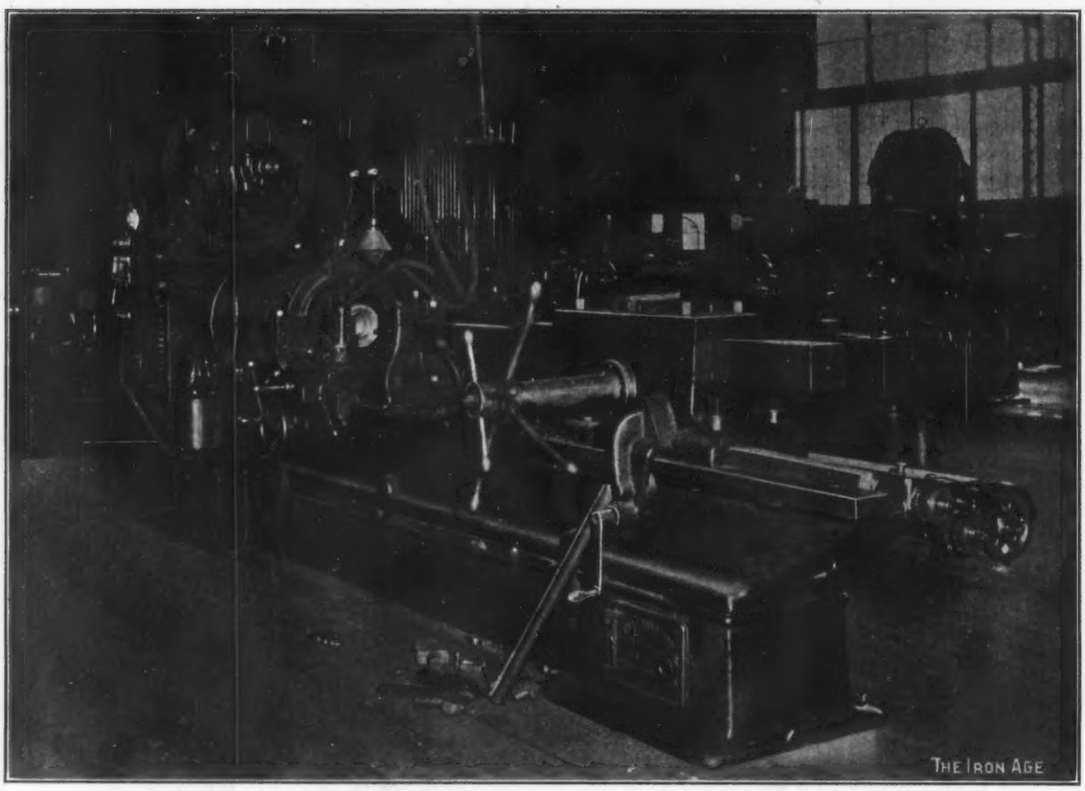


Fig. 2.—Motor Driven Horizontal Boring Machine for Boring Out Projectiles.

Fig. 3.—The Forging Before and After Turning and a Completed 8-Inch Projectile.

After annealing the forging is taken to the machine shop and the projection on the small end centered in a centering machine. It is then transferred to a lathe, the butt end being chucked and the small end supported by the center in the tail stock. The machining is begun at the point of the projectile, the lathe speed being decreased with the increase of diameter by varying the motor speed, which illustrates one of the many phases of machine work where variable speed motors are exceedingly valuable, the operator being able to gauge the proper speed by watching the color of the chip.

After the lathe work is finished the partially completed projectile is placed in a cutting-off machine and the unfinished end that was clamped in the chuck removed. The work is then transferred to a horizontal boring machine, where the recess or chamber for the explosive is bored out. The chamber is threaded near the

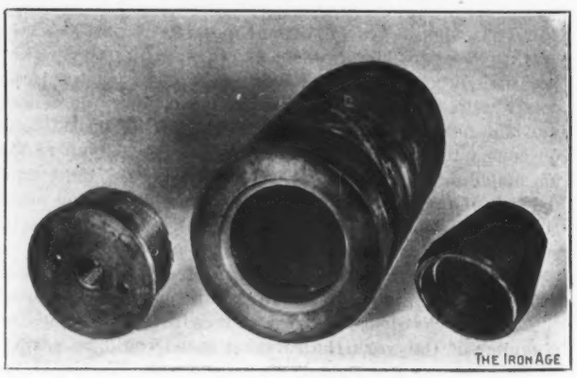


Fig. 4.—The Three Parts of a Complete Projectile, Plug, Shell and Cap.

butt to receive a plug, in the center of which is a smaller plug. Through the latter the fuse is inserted that is ignited by the firing charge and communicates with the explosive at a predetermined time interval, causing the projectile to burst after entering the object at which it was directed.

At two points on the barrel of the projectile the diameter corresponds to the bore of the gun, and at a third point near the large end a groove is cut in the barrel into which a copper band is hammered. This, when finished, is slightly larger in diameter than the bore, causing it to engage in the rifling, giving the projectile a rotary motion. A groove at the butt provides a means for removing the projectile if for any reason it is not discharged after being placed in the gun.

The points of the projectiles are covered by a soft steel cap, which, in some manner not thoroughly understood, enables the projectile to penetrate a plate with a

Fig. 5.—An 8-Inch Projectile Before and After Piercing an 8-Inch Armor Plate.

much lower velocity than is required with uncapped shells. The cap is held in place by wire driven into a recess formed by the coincidence of a groove cut in its interior with that of a groove cut on the point of the projectile. The treating or hardening process to which the projectiles are subjected after machining is not made public. Fig. 4 shows the three parts forming a complete projectile and Fig. 5 the condition of an 8-inch projectile before and after piercing an 8-inch armor plate.

The opportunity of comparing the relative outputs of similar machines performing the same class of work rarely presents itself in as forcible a manner as in this plant. The old projectile shop still uses belt driven lathes, some with wide belts. These belt driven lathes are of the same type as the motor driven lathes, and the result of some interesting tests of the number of projectiles finished in ten hours shows conclusively the greatly increased efficiency of motor driven machines:

Diameter of projectiles, inches	6	7	8
Number of projectiles finished in ten hours, motor driven lathe	38	32	25
Number of projectiles finished in ten hours, belt driven lathe	27	27	17
Per cent. increase	40.7	52.3	47

Average increase in output, 46.6 per cent.

The belt driven lathes will eventually be changed to motor drive by adding an inexpensive mounting for the motor. The shop with the motor driven machines presents a clean and light appearance. The absence of belting, with the exception of that driving the group of small machines, is a noticeable feature, which naturally aids in cleanliness and gives unobstructed light, both natural and artificial.

Radical Labor Legislation in Great Britain.

The London *Engineer* reproduces from *The Iron Age* the substance of the decision of the Pennsylvania Supreme Court in the case of Purvis & Co. of Butler, Pa., against the Carpenters and Joiners' Union, and calls it an "American Taff-Vale case." In addition to affirming a judgment for damages against the union for boycotting Purvis & Co. material, the decision held that it was unlawful for the union to coerce its own members into quitting work, the judges saying: "Members of the union were coerced by the compelling power of the union to quit work on pain of trial, fine or expulsion, with its attendant annoyance and possible ostracism in case of their refusal. The principle on which the cases, English and American, proceed, is that every man has the right to employ his talents, industry and capital as he pleases, free from the dictation of others, and if two or more persons combine to coerce his choice in this behalf it is a criminal conspiracy." On this the *Engineer* comments as follows:

> The last paragraph of this judgment states what is still at the moment of writing the principle on which the English courts proceed. What will the American judges say when our Legislature, by its Trades Dispute bill, has declared that principle to be unsound? The sanction by which a union enforces its rules is, and must ever be, coercion in some form or other. So far as we can see at present, nearly everything that was declared illegal in this strike in Pennsylvania will be lawful in this country if the Trades Dispute bill is passed. It is true that violence and destruction of property are to remain illegal; but the funds of the union cannot be drawn upon to pay damages. We commend to the attention of those who are in favor of the suggested changes in our own law this case in Pennsylvania.

The Consular Service to Be Reorganized.

Secretary of State Root has issued an order creating a board of five officers, comprising some of the most experienced consuls, which will meet in Washington June 4 to prepare plans for the reorganization of the American consular service. The board is constituted as follows: Frank H. Mason, consul general at Paris; Charles M. Dickinson, consul general at Constantinople; Robert S. Chilton, Jr., consul at Toronto; Edward H. Ozmun, consul at Stuttgart, and George H. Murphy, consular agent at St. Catherines.

Secretary Root, in connection with the development of his plans for the improvement of the consular service, is giving great attention to the education of young men for a consular career, and is in consultation with some of the leading educators of the country on that subject. Dr. Nicholas Murray Butler, president of Columbia University, has informed him that arrangements have been made already for a combined course of Yale and Columbia universities to carry out this idea.

Testing the air cushions of the elevators installed in the new Hall of Records, New York City, by the Standard Safety Air-Cushion Company, was recently accomplished in an interesting manner, as reported in *Compressed Air*. A car weighing 3500 pounds and containing two dozen eggs placed on the floor of the car was dropped from the eighth story, and after falling 125 feet was halted safely without displacing enough eggs to destroy the pattern of their layout on the floor, and only a few of them were cracked.

The Heald Ring and Surface Grinder.

The grinder shown in the illustrations is designed to grind piston and other flat rings, disks, dies, thrust collars, saws and similar work, whether flat or with angular adjustment, as in milling cutters, saws and other tools, which need to be thinner at the center to give proper clearance. In practice one of the most general uses of this machine is the grinding of piston rings for automobile and other combustion engines, where exact work is all important, because of the loss of power, which attends the slightest leakage past the piston. The special features of the machine are a magnetic chuck for holding the work; micrometer adjustment for thickness of work; angular adjustment for grinding convex or concave; automatic and variable cross feed to grinding wheel; automatic vertical feed to chuck, when desired, and eight different speeds for rotating the work. The machine embodying these latest improvements is shown in Fig. 1, mounted on a pedestal, and is manufactured by the Heald Machine Company, Worcester, Mass.

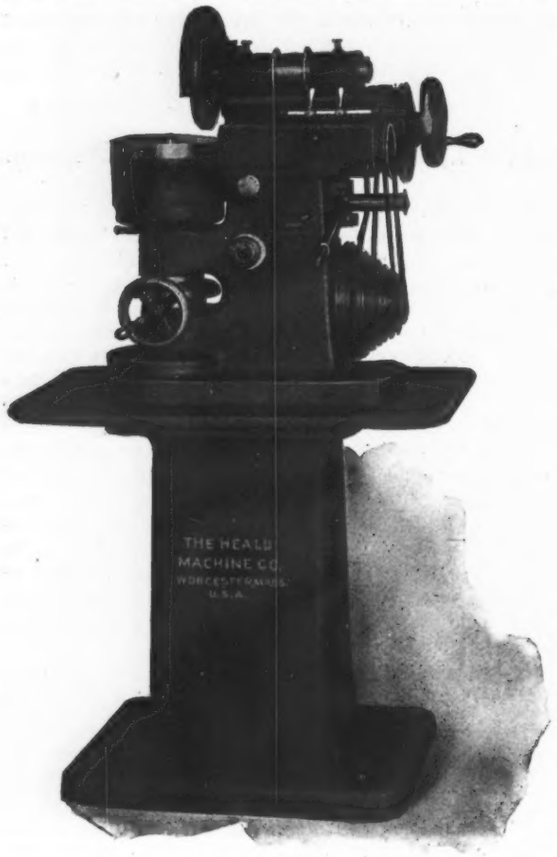


Fig. 1.—Style 210 Ring and Surface Grinder, Built by the Heald Machine Company, Worcester, Mass.

The main frame of the grinder carries a vertical spindle, on which the magnetic chuck is mounted, or, when it is desired to grind non-magnetic work, such as brass, bronze or hard rubber, a three or four-jawed chuck is substituted. This spindle is fitted with a micrometer vertical adjustment reading to thousandths of an inch, or to hundredths of a millimeter, if preferred. The micrometer adjustment is combined with a hand wheel for raising and lowering the chuck, or with a combination hand and automatic power feed, which will be considered in detail later. The chuck is driven by a large cone pulley giving eight speeds for different diameters of work. The upper part of the frame supports a crosshead carrying the grinding wheel, and is made adjustable so that the wheel will not only grind flat surfaces, but concave and convex. The method of securing this adjustment is shown in Fig. 2. The binder bolt *a* releases the entire head and permits it to be swung within limits on the bolt *b*.

The wheel slide is fitted either with hand feed only, or with automatic power feed by means of which the wheel will travel from the outside to the center of the chuck and back again, and reciprocate continuously if desired. The position of the wheel and amount of travel are controlled by the adjustable dogs on the side of wheel slide. The cross feed mechanism is the same as that of the Heald cylinder grinder, which was described in detail in *The Iron Age*, April 12. This includes the stop motion by which the feed is automaticlly stopped after a single passage back and forth across the work. The feed differs in one single respect, that in the disk grinder the revolving screw *c*, Fig. 2, is employed to carry the wheel slide forward and back. The automatic feed has two speeds, for roughing and finishing, which in conjunction with the eight speeds of the revolving chuck gives a wide range of operation.

The automatic vertical feed, which does not appear in the general views of the machine, or in the assembled drawing, is given in detail in Fig. 3. The center line of the wheel spindle is shown at A. The foot of each of the two adjustable dogs B is bevelled and strikes against the lever C, which has inclined surfaces corresponding to the angle of the dog. In operation the dogs are so adjusted that when the wheel slide almost reaches the end of the required travel the dog comes in contact with the incline of the lever, giving to it a downward motion, which is transmitted to the feeding mechanism through the long link D. The lever C is connected with the eye bolt E, the spring of which tends to maintain the lever C in its upper position; that is, after it has been depressed by the action of the dog, the lever is returned to position by the spring,

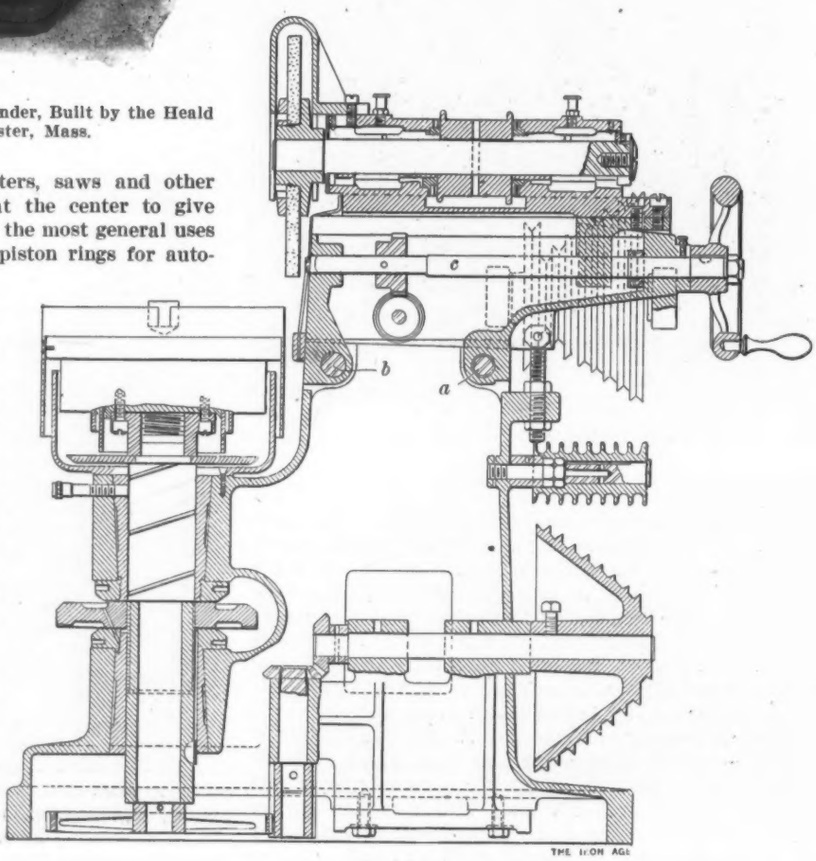


Fig. 2.—Sectional Elevation of the Heald Ring and Surface Grinder.

ready for the next operation. The eye bolt has another function, in that it may be adjusted to regulate the amount of feed. When the lever C acts upon the link D

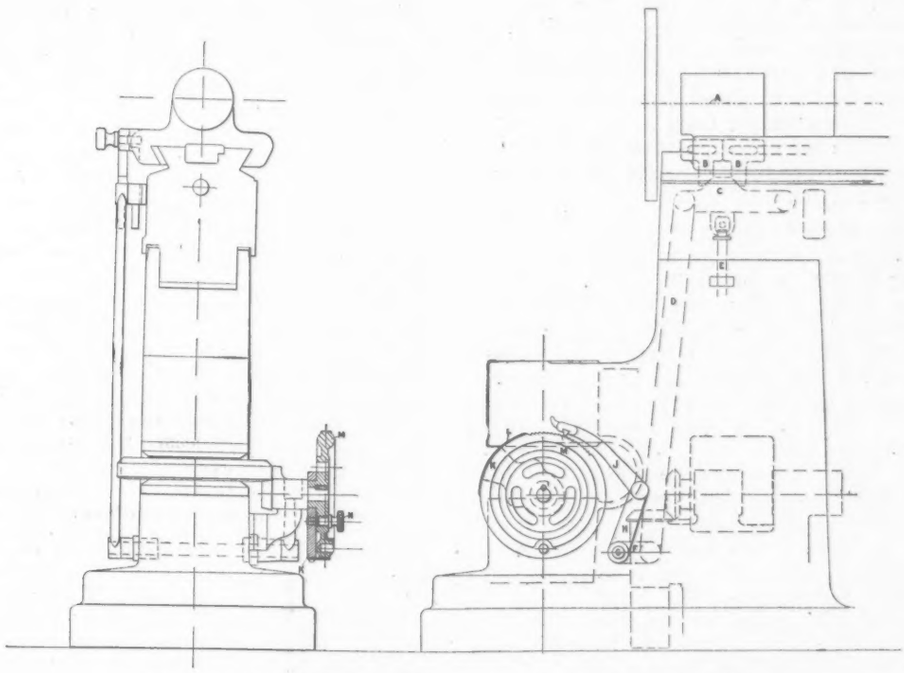


Fig. 3.—End and Side Elevation Details of the Automatic Vertical Feed.

and depresses it the motion is carried on through the crank F, fast upon the shaft G, and through a second

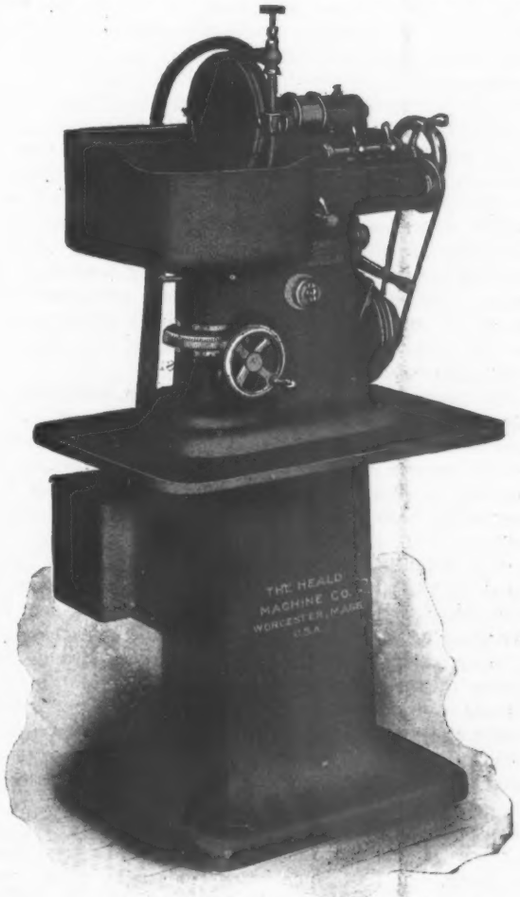


Fig. 4.—The Heald Ring and Surface Grinder Arranged for Wet Grinding.

crank H, also fast to G, at the front of the machine. This second crank actuates the pawl J, which operates the ratchet wheel, accomplishing the feed, performing automatically what is done by the hand wheel, in Fig. 1. There is also a hand feed in conjunction with the power feed, the ratchet being combined with a hand wheel.

An interesting stop motion is employed, to enable the operator to set the machine and leave it while attending to others. At the back of the wheel is the segment K, the position of which determines the point at which feeding ceases. The segment is set and locked in position by the screw N. The machine keeps feeding automatically until the ratchet has rotated a predetermined number of teeth, after which the pawl is unable to engage the next teeth, because they are covered by the guard L of the segment. The pawl acts idly on the guard and feeding ceases. The feed is ¼ of 1-1000 inch for each tooth of the ratchet. In conjunction with the micrometer wheel on the screw, reading to thousandths, it is easy for the operator to place the stop segment at the desired point.

The bearings of the chuck spindle are fitted with taper bushings, which can be closed up and adjusted by the two collars immediately above and below the graduated hand wheel. The grinding wheel spindle is similarly fitted. The bearings are provided with dust guards and are adjustable for wear. The gearing is fully enclosed.

The diameter of the magnetic chuck is 8 inches, greatest distance chuck to center of wheel 5¼ inches; vertical adjustment of chuck 1¾ inches; hight of chuck from floor 44 inches. The Heald Machine Company is adding to this line a machine for handling similar work of larger size, up to 20 inch diameter, designed on a similar plan but with certain modifications, due to the difference in range of work to be handled.

When the machine is intended for wet grinding it is fitted with a rectangular water guard about the chuck, as shown in Fig. 4, and the wheel is furnished with a special guard and water supply pipe. A large water tank with pump is mounted on the rear of the pedestal and connection is made for both supply and waste pipes. For grinding hardened steel dies, collars, saws and case hardened pieces the use of water is of great advantage, as it guards against drawing the temper of the work, and in the case of thin pieces overcomes the tendency to spring or warp out of shape from unequal heating. The magnetic chucks used on these wet grinders are specially constructed for use in grinding with water, which is not the case with those regularly furnished on the dry grinders.

Woods & Huddart, dealers in structural material, rails, wrought pipe and lock bar steel pipe, have established their headquarters at 2123 Pierce street, San Francisco, and are now in position to furnish supplies in the lines stated.

The Tin Deposits of Alaska.

WASHINGTON, D. C., May 26, 1906.—The most important contribution of the year to the literature of the tin deposits of the United States has just been completed by Frank L. Hess, of the United States Geological Survey, who last August and September visited and examined the prospects and development work in the York region of Alaska. Through the courtesy of the Survey the correspondent of *The Iron Age* is enabled to present the following abstract of Mr. Hess' report:

The York Lode Tin Deposits.

The first discovery of lode tin in Alaska was made in the summer of 1903, on Cassiterite Creek, a tributary of Lost River, about 7 miles from the sea. A small amount of prospecting was done that year, enough to show that the tin ore occurred in a large metamorphosed acidic dike. During 1904 and 1905 prospecting continued, several more dikes carrying cassiterite were found and several veins in the limestone were discovered. At the time of the writer's visit to this region, in September, 1905, the only known local deposits of cassiterite were on the Crim, Randt, and O'Brien group of claims, and one other, Discovery claim, on a dike known as the Dolcoath lode. The Crim, Randt, and O'Brien deposits include those originally discovered and several veins and tin-bearing dikes found since. The original discovery was on a rhyolitic dike, called the Cassiterite lode, running from Cassiterite Creek across the mountain eastward to Tin Creek, a distance of about a mile.

During 1904 two tunnels were driven into the main dike on these claims. In 1905 another tunnel was run into a hill somewhat lower. In this the dike was again found and is said to carry tin. Owing to water in the tunnel, work was suspended until the freeze-up. By stripping the debris, 3 to 10 feet thick, another dike or a branch of the one described above was uncovered about 100 feet to the south. The dike was laid bare to a width of 25 feet, but its full thickness was not reached.

Several small tin-bearing veins were found in the dikes, varying in width from 1 to 2 inches, and occasionally widening out to form vuggs almost entirely filled with beautiful dark cassiterite crystals embedded in fluorspar and zinnwaldite (a lithia-iron mica).

A prospect cut in the bank of the creek exposed the same carrying a small amount of tin. A stream-cut bench in the dike 3 to 4 feet above the present creek bed, covered with 3 feet of gravel overlain by about 8 feet of debris, was also exposed. The gravel carries angular crystals of cassiterite and from the ease with which it can be handled would probably pay for working in a small way. To judge by the contour of the surface, the gravel deposit appears to be a quarter of a mile long and 50 feet wide.

A dike known as the Ida Bell lode is on the west side of Cassiterite Creek, just above the Cassiterite lode. A tunnel has been run about 100 feet along the east side of this dike, with a crosscut about 50 feet from the mouth. Some tin is found along a horizontal fault zone on the east side of the dike, and more is said to have been found at the end of the tunnel. About 500 feet north of the Ida Bell is another dike called the Bear lode. A tunnel about 55 feet long was run into it from the creek level and a winze sunk 69 feet along the west or hanging wall. This was filled with water, so that it could not be entered. It was said that many small tin-bearing veins were found running in various directions, most of them near the middle of the dike. Fragments of rock in the dump showed veins of almost pure cassiterite and quartz about one-half inch thick, and other veins carrying cassiterite, chlorite, and some wolframite up to 1½ inches thick.

Promising Prospects Near Cassiterite Creek.

At a number of places in the neighborhood of Cassiterite Creek the proximity of dikes is indicated by the vast number of siliceous veinlets in the limestone. Three known tin-bearing veins of noticeable and possibly workable size occur in the limestone. One is a quartz vein about 4 inches wide, on what is known as the Jupiter claim, but it has been traced only a short distance. During 1904 a few tons of ore were extracted from this vein and shipped to Seattle. Another vein occurring a few rods northeast of the one just described is about 4 inches thick and has been traced between 200 and 300 feet. It is composed of slender quartz crystals forming interlocking combs. On the quartz crystals, and sometimes embedded in them, are small crystals of cassiterite, occurring singly and in small masses. On the hill between Lost River and Cassiterite Creek is a third vein about a quarter of a mile southwest of those already described. It is from 1 inch to 6 inches thick, and has been followed by an open cut about 30 feet along the strike and 10 feet along the dip. The quartz and cassiterite are rather finely crystallized and fill the vein with a banded structure.

The limestone is much altered for several feet on each side of the veins, and whether they will pay to work seems to depend largely on how much tin is carried in the altered limestone accompanying them. Should the dike deposits be mined, at least the first-described vein would probably pay if worked in connection with them. There seems little doubt that these veins can be traced to the rhyolitic dikes in the neighborhood.

The Cape Mountain Area.

On Cape Mountain prospecting for tin has been carried on since 1902, and a large amount of work has been done, especially by the Bartells Tin Mining Company. It is a particularly bleak, inhospitable portion of the country, and the determination and endurance of Alaskan prospectors are exemplified in the men who are attempting to open up the tin mines, this applying with equal force to Buck Creek, and only in a less degree to Lost River. Fine pieces of float tin ore made up of quartz, tourmaline and cassiterite were found at many locations in the vicinity of Cape Mountain, but it was not until 1904 that the ore was found in place. During 1905 there were further discoveries of tin ore that made the outlook encouraging.

Float cassiterite is reported from the vicinity near Cape Mountain. It is reported from the vicinity of Cape Prince of Wales, and a fine piece, weighing several pounds, is said to have come from a point about 12 miles east of the cape. Little has been seen on the south side of Cape Mountain, and by far the largest amount has been found on the north and northeast sides, where masses of nearly pure cassiterite, weighing from 20 to 30 pounds, have been picked up. The float indicates three distinct sets of veins—veins of cassiterite with tourmaline and quartz, tin-bearing quartz veins, and veins of almost pure cassiterite.

The plant of the Bartells Tin Mining Company includes an assay office, storerooms, engine and living rooms under one roof at Tin City. A gasoline engine furnishes power for electric drills used in mining, to which the current is carried about a mile across the mountain by bare copper wires. The electric drill seems peculiarly well adapted for work in this region. A 3-stamp Merralls mill, with Wilfley tables, was being erected at the time of the writer's visit, and a well to obtain water for winter working was being sunk near by. The finding of water in this frozen ground is problematical, though not totally hopeless, there being strange differences in the depth of the frost at different places. At Eagle, water is obtained below 50 to 60 feet of frozen ground; at Rampart a hole 225 feet deep had not reached the depth of the frost; at Nome, in places, there is no permanent frost in the ground, while at other places it goes down over 100 feet.

Prospect tunnels and shafts have been dug at numerous places, and a large amount of work has been done upon them. In 1904 some small tin-bearing veins were struck in a prospect tunnel known as the Lucky Queen, about 1½ miles north of Tin City. This tunnel was unused and largely filled with ice in 1905, and the principal operations of the company had been transferred to the North Star claim, lying a short distance east. By far the largest and most promising prospects so far found are in the North Star tunnel, driven into the granite over 200 feet. A short distance from the mouth of the tunnel a large limestone inclusion was passed. About 100 feet

from the mouth of the tunnel another inclusion of limestone was struck that was in a broad band 10 to 20 feet thick. Along both sides of this limestone was a considerable amount of iron oxide, carrying some tin. The contact of the limestone and granite was followed to the northeast about 52 feet, where the dip became almost vertical. A winze was sunk 20 feet, when the dip became gentler (17 degrees), but 70 feet from the winze the contact dips 37 degrees.

From the foot of the winze an incline with its floor on the limestone has been run about 90 feet, parallel to but in the opposite direction from the main tunnel. Tin-bearing veins were struck at several places along the course of the incline and drifts turned off at two places. One of these is said to carry pay ore, but had not been systematically sampled. In the second drift 3 feet of rock, much impregnated with iron oxide and carrying a large amount of cassiterite, was encountered. About 20 feet from the mouth, another, and by far the most promising, ore body, was found. This ore body follows a vertical fault, formed by the replacement of the granite, through a space of from 12 to 18 inches on each side of the fault, by quartz, tourmaline, cassiterite, feldspar, and a decomposed mineral in long, white crystals. The whole vein averages between 2 and 3 feet in width. Little that is definite can be said of the richness of the deposit, as it was struck only the day before the writer left the vicinity, and it had not been sampled, but it appears promising. It is reported that work during the next few days showed the ore body to be increasing in richness. Some tin ore was found in the main tunnel 30 feet above, which may have been the same deposit, though at that point the vein is said to be small.

Other Prospecting Operations.

About 1 mile north by west from the North Star, and 2 miles northeast of Cape Mountain, a large amount of excellent float-tin ore has been picked up in the vicinity of a granite sill in the limestone on Walker, Lovell & Co.'s prospects. The cassiterite is imbedded in masses of fine needles of light-blue tourmaline, occasionally with portions of granite adhering to the mass. Lumps of the ore have been found that were estimated to weigh 400 pounds or over, of which by far the larger part was tourmaline. A prospect tunnel has been run into the limestone nearly 100 feet at this point, and about a quarter of a mile north by west an open cut made, which uncovers two thin sills, one of aplite carrying small crystals of fluorspar and one of coarse pegmatite.

About half a mile east of Walker, Lovell & Co.'s claim Goodwin & Carlson had run a prospect cut along the contact of a granite dike with the limestone country rock. Faulting is evident, there being 2 to 3 feet of crushed rock along the contact. The granite carries some fluorspar and brassy looking pyrite. The limestone above the granite is silicified through an area several hundred feet wide, silicification gradually lessening in the outer part of the area.

The United States Alaska Tin Mining Company has a claim and a couple of small warehouses on the beach at Tin City and has started a 10-stamp mill a quarter of a mile back from the beach. Power is to be furnished by a gasoline engine. The claim on which the company is at present working is situated on the north side of Cape Mountain. A shaft sunk on this claim is said to be 15 feet deep, but was filled with water, so that it could not be seen at the time of visit. A contract was let in the fall for 300 feet of tunnel to be run during the winter from a point lower down the hill, in the hope of cutting within that distance the vein from which the quartz float is derived.

Prospecting has been or was being done at a large number of other places. It was said that float-tin ore had been found nearer the cape, and some prospecting done, but the locality was not visited. At another point a dark basic dike was being prospected by a crosscut, but in such rocks the chances of finding tin ore are small.

At present wages in the York region are $5 and board, and good board cannot be considered as worth less than $1.50 to $2.50 per day, making wages the equivalent of $6.50 to $7.50 per day. It seems safe to figure that under present conditions nothing less than 2½ per cent. ore can be worked with a reasonable assurance of profit.

Placer Deposits.

The placer tin deposits on Buck Creek are the only ones in Alaska from which there has been any production and they have yielded to date about 91 tons of ore that would average probably 65 per cent. of metallic tin. In this amount is included the production of 1905, which was very small, owing to bad weather and other reasons. During the year the trail between York and Buck Creek was changed somewhat. The total haul is now from 14 to 16 miles.

But one company operated on the creek during the season. Its plant consisted of an oil-burning 35 horsepower upright boiler and engine, French scrapper with belt conveyor, and sluice boxes elevated 16 feet above the ground. Two sets of sluice boxes side by side are used, so that there need be no stoppage of work for clean ups.

The work has shown the gravel to carry an average of from 20 to 30 pounds of concentrates, running from 60 to 70 per cent. of metallic tin and about 40 cents in gold per cubic yard. The gravel is from 120 to 160 feet wide, averaging about 125 feet, by 3 to 6 feet in depth, averaging about 4½ feet. The tin bearing gravels extend from the mouth of Peluk Creek, a tributary of Right Fork. Left Fork and Peluk Creek are said to also carry stream tin, but obtaining water for sluicing will be a serious difficulty in case of the latter. Sutter Creek has so far shown but little stream tin. There is probably a length of about 4 miles of tin bearing gravels in the Buck Creek Valley.

The great interest that these deposits have aroused is shown by the amount of "experting" that has been done. At least seven parties have been sent to Buck Creek by firms or private persons to examine and report on the tin gravels, and the expense has probably been much in excess of $50,000. Holes have been started where bed rock could not be reached except with a steam pump, or a bed-rock drain, neither of which was to be had, and signs of crosscuts are almost wholly wanting, yet reports were probably made on the depth and value of these gravels. One man said that it was "impossible to examine any of the rock in place, except on the extreme summits," and yet the bare slate stands along the creek in a bluff 75 feet high.

W. L. C.

Concrete as a material for tall chimney construction is growing in favor, as may be seen by noting the fact that during the past 18 months three have been constructed or projected in the far Western part of the United States alone, each more than 200 feet in height. The chimney erected for the Portland General Electric Company is of concrete steel, 230 feet high, with a 12-foot flue. For the Tacoma Smelting Company one has been erected 300 feet high, with a flue diameter of 18 feet. The largest of all, that projected for Butte, Mont., is to be 450 feet high. Among the special advantages claimed for this construction are the ability to dispense with a lining, as the concrete will resist any temperature up to 1500 degrees, and the provision of a smooth surface, both inside and out. It is also a good nonconductor of heat.

There has recently been turned out from the Rickmers' yard in Bremerhaven a peculiar type of ship which might be designated a steam sailing vessel, it being a five-masted bark with auxiliary power, to be used when contrary winds are encountered. The ship has a length of 402 feet, an extreme breadth of 55 feet and a depth of 32 feet. The displacement under full load is 11,350 tons, while the dead weight carrying capacity is 8000 tons. To offset the difficulties incident to narrow channels and head winds, a triple expansion engine of 1000 horsepower is fitted for propulsion whenever required. The speed under steam is some seven or eight knots. The bunkers will carry 630 tons of coal, which would suffice for a trip of 4500 miles. The winches and steering gear are operated by steam.

Ornamenting Metallic Surfaces by Inlaying.

Damascening or the ornamenting of metallic surfaces by inlaying patterns of other metals was discussed along with other methods of metal ornamentation by Sherrard Cowper-Coles in a lecture before the Society of Arts in London May 8. London *Engineering* gives an interesting synopsis of the address: Two principal methods of inlaying were practiced by old-time Moorish workmen. In the first, dovetailed grooves were cut in the surface to be decorated and the design filled in by hammering in wires of the metal to be inlaid. The other process consisted in cross hatching the surface with fine lines like a file where the precious metal was to be inlaid, and hammering the latter in so that it was held securely by the minute teeth formed by the crossing of the lines. The whole was afterward polished and possibly chased as a further refinement. Niello work, still practiced largely in the Caucasus and to a less extent in Italy, Siam and Turkey, consists in producing a design in dark lines upon a smooth metallic surface, usually of silver or gold. The design is engraved on the surface and the incised lines filled in with a borax flux, after which a powder compounded of sulphur, silver, copper and lead, fused together, is spread on the plate and carefully melted. The superfluous sulphide, when cold, is scraped off, and when the plate is repolished the most delicate detail of the design appears. There are also the methods of depositing gold by the evaporation of a matured mixture of sulphuric ether and nitro-muriate of gold, the soldering or fusing of a veneer to the surface and the electro deposition of metal.

About five years ago Sherrard Cowper-Coles discovered that metallic dust when heated to a temperature far below its melting point seemed to give off vapor which would unite with other metal surfaces buried in it. By being baked in zinc dust, iron can be coated to any desired depth with zinc, and a thorough protection against rust insured. The process is also useful for decorative work, for by confining the deposition of the metal from the dust to desired areas, by coating the other parts with a suitable composition, practically any pattern may be produced. The deposition is perfectly adherent; in fact, there is no definite division between the two metals, but an alloy, merging on either side into pure metal. Extremely delicate patterns may be formed. A temperature of 500 degrees F. will cause zinc to be deposited from commercial zinc dust, although the melting point of zinc is nearly 300 degrees higher. Other metals besides zinc may be deposited in the same way, and the various colored alloys add to the beauty of the pattern. If the surface is previously etched with acid the final pattern may be flush with the original surface, or it may be raised as much as desired. Electrotypes in which the figures in relief are so treated have a particularly pleasing effect.

The report presented at the recent meeting of the Iron and Steel Institute in London showed that the membership was 2033 at the close of 1905, as compored with 1555 at the close of 1895.

Yale & Towne Electric Trolley Hoists.

For conveying all kinds of material and handling loads ranging from a few hundred pounds to 10 tons overhead trolley systems have an attractiveness peculiarly their own. Such a system can easily cover an entire plant aggregating several thousand feet of track, in which may be incorporated curves, switches, turntables, and lateral spurs, so that every nook and corner of the establishment can be reached. The handling of material in this way is very economical, as one man can easily handle a load under 2 tons, with trolleys of the best design, and two men can handle 10 tons, without gearing, pushing the load along as fast as they can walk. One of the latest acquisitions to the new Wanamaker store in New York City is a complete overhead trolley system of standard I beam track, installed by the Yale & Towne Mfg. Company, New York City.

Still greater economy of labor and more rapid handling of output is obtained by the use of electric driven hoists and trolleys, such as are shown in the illustrations. The trolley hoist appearing in Fig. 1 is constructed of wrought steel for all parts subjected to tensile stress. The general design is such that the lines of force due to the load meet at the point where the load is suspended in the trolley eye, giving maximum strength. The track wheels are keyed to the axles and the ends of the axles turn at each end in patent bronze bearings. This provides strong and easy running journals, and is considered better practice than fixing the axles and having overhung bearings.

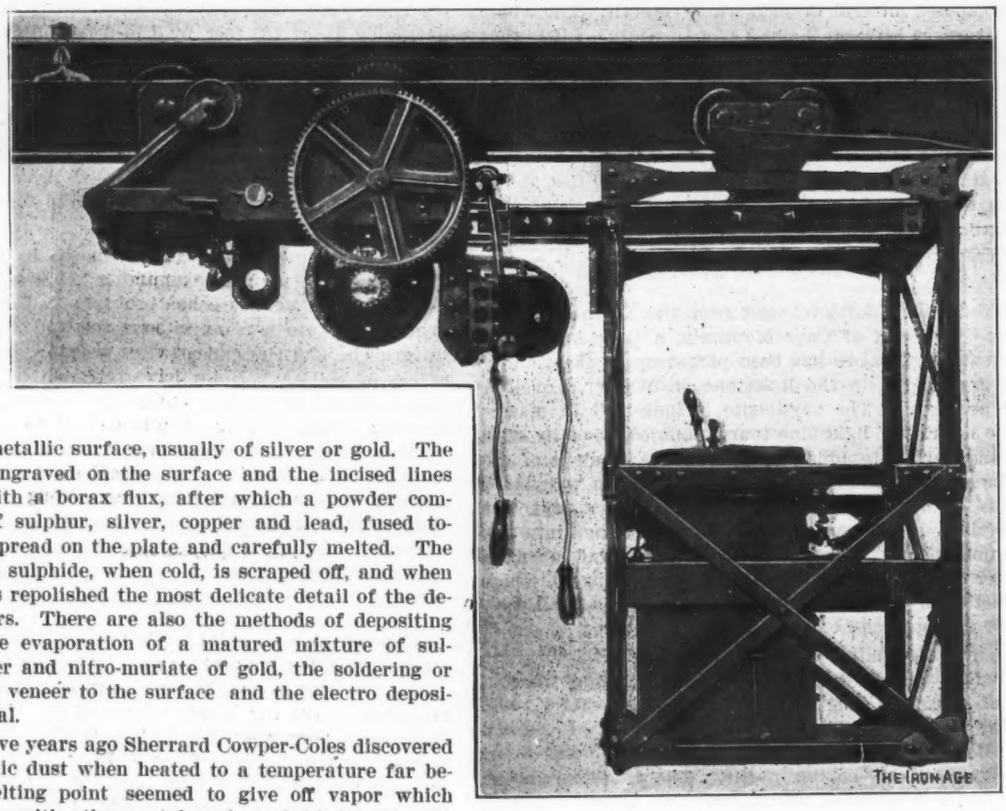


Fig. 1.—A Yale & Towne Motor Driven Trolley with Operator's Trailer Cage.

The hoist attains a traversing speed of 350 feet per minute, fully loaded, on straight track. The current is taken from bare copper trolley wires stretched alongside the I beam, or where the machine passes over switches or turntables from bare copper strips, which are insulated on the under side of the I beam, contact being made through collector shoes on the trolley. In Fig. 2 the hoisting mechanism is shown attached to the trolley by a hook connection, which gives flexibility and permits the hoisting mechanism to swing out to an angle when a lift is made from a point not directly under the

machine. Lifts at an angle of as much as 45 degrees may be made with this equipment.

The I beam track may be bolted directly up against the under side of the overhead support, requiring little head room. The trolley requires very little more head room than the actual depth of the track and the complete machine may be used in very low buildings. The hoisting mechanism supports the load on two drums, which are keyed to the same shaft. The two hoisting ropes wind on the drums in such a manner as to balance the load on the single point of support in the trolley eye. This always insures the trolley being equally loaded on its four wheels, further insuring the proper tractive resistance on the geared trolley wheels, to pick up the

Fig. 2.—Yale & Towne Electric Hoist and Trolley Handling Coal and Ashes.

traversing speed properly and prevent grinding on the track.

Where extremely long distances are to be traversed by the equipment an operator's trailer cage is attached to the motor trolley, as indicated in the engravings. Fig. 2 shows a standard 2-ton electric hoist hooked in a 2-ton motor driven trolley with trailer cage attachment. The trailer trolley shown is connected to the main trolley by a swivel connection, so that the whole equipment will traverse short radius curves, and is arranged so that the customer may substitute a special trailer cage instead of the regular one. The trailer cage shown has been made to drop low enough for the operator to control the horizontal movement of the trolley and the hoisting movement from the cage, and at the same time dump and manipulate the bucket or load from the cage.

A motor trolley hoist of this character can also be used as a locomotive for pushing or pulling several loaded trolleys along the I beam runway. Such a system can reach all parts of the plant, warehouse or yard, handling material to and from nooks and corners which are impossible to reach with overhead traveling cranes, industrial railways or trucks. A single operator with such an equipment could handle a large amount in a day, landing material at all parts of a works, which may be covered by an I beam system incorporating switches, turntables and lateral spurs to all machines and storage locations. At the same time such a system may supplement the traveling cranes in the larger bays. This system can be supported from brackets on the side columns or attached direct to roof trusses.

The trolley hoist may be operated from the cage, or from the floor at a point near the work. The hoist may readily be removed from the trolley and the trailer cage can also be easily disconnected from the motor trolley, making the machine adaptable to all classes of usage, and insuring ready accessibility to all parts for attention and adjustment. The machine is comparatively simple and ought to stand a long period of severe usage, with little expense for repairs.

Remarkable Record of Coal and Ore Roads.

The results of operations in 1905 on the Pittsburgh & Lake Erie and the Bessemer & Lake Erie Roads are referred to by the *Railroad Gazette* as little short of mavelous. It says: "When two railroads are able to show average revenue trainload figures, one of 937, the other of 1076 tons, it is remarkable enough; but when we learn that the average tonnage southbound on one of them is 1406 tons per train, there is a chance to realize the immense economies of modern methods of handling heavy tonnage. The Bessemer & Lake Erie, which shows this exceptional figure, is largely an ore-carrying road, ore furnishing nearly six of the 9,500,000 total tonnage. As part of the machinery developed by the United States Steel Corporation for transferring Lake Superior iron ores to the Pennsylvania mills, the road shares in the tremendous economies which have been brought about by modern methods of handling and transportation. On the Pittsburgh & Lake Erie, on the other hand, coal and coke furnish over 14 of the nearly 25 million tons, ores amounting to not quite 3,500,000 tons. A large tonnage of manufactured iron and steel products in addition helps to make the road nearly twice as heavy an earner on a mileage basis as the Philadelphia & Reading, which has the next largest gross earnings per mile of any American railroad. The fact that the Vanderbilt road is operated at 43.4 per cent. of gross for expenses and the Steel Corporation's line at 48.99 per cent. goes to show how profitable railroad operation can be when sufficient traffic is available."

In commenting on some of the records of production at Steel Corporation blast furnaces in March, as given in our issue of April 19, 1906, the London *Iron and Coal Trades Review* says: "If the production of pig iron in our own country could be carried on and maintained under the same conditions, 40 furnaces would be equal to supplying the whole of our pig iron output, instead of the 350 required to achieve that result at the present time. We have seen pig iron production go from an average of less than 25,000 tons a year per furnace to one of over 234,444 tons in a few years. What may it not reach in another half century?" The latter figure can scarcely be spoken of as an average annual output, as it is arrived at by multiplying an exceptional month's record by 12.

In Canada's third census of manufactures, recently issued, are given interesting figures showing the distribution of charges in connection with the production of iron and steel manufactured articles. In Canada the percentage accounted for by labor charges is 33.87; materials absorb 42.48 per cent.; miscellaneous expenses, 5.95 per cent. This leaves 17.7 per cent. for fixed charges and profit. These items are contrasted with similar ones for the United States, as follows: Labor, 24.53 per cent.; materials, 49.35 per cent.; miscellaneous expenses, 10.79 per cent.; fixed charges and profit, 15.33 per cent. It would appear that, considering the higher cost of labor generally in the latter country, the figures as given show the American product figured on the basis of a more advanced stage of development.

The Chemist in the Machine Shop.

BY H. S. BROWN.

In designing and constructing gas engines, and in fact most machinery, the chemist should be consulted at the outset. He should decide as to the carbon, silicon, sulphur, phosphorus, manganese and nickel in the iron or steel, so that the machine will meet the conditions imposed by the purchaser. The material must be such that it will machine at a cost to meet competition, and to this end also an analysis is important. If a broken piston rod or a hot crank pin or main shaft bearing were analyzed, it would show that the chemist had not been consulted in the construction of the machine.

The steel parts are not the only ones which should be considered, for the castings should be as well. There is a demand from many engineers that the cylinders, valves, &c., of an engine should be hard, but there is a difference

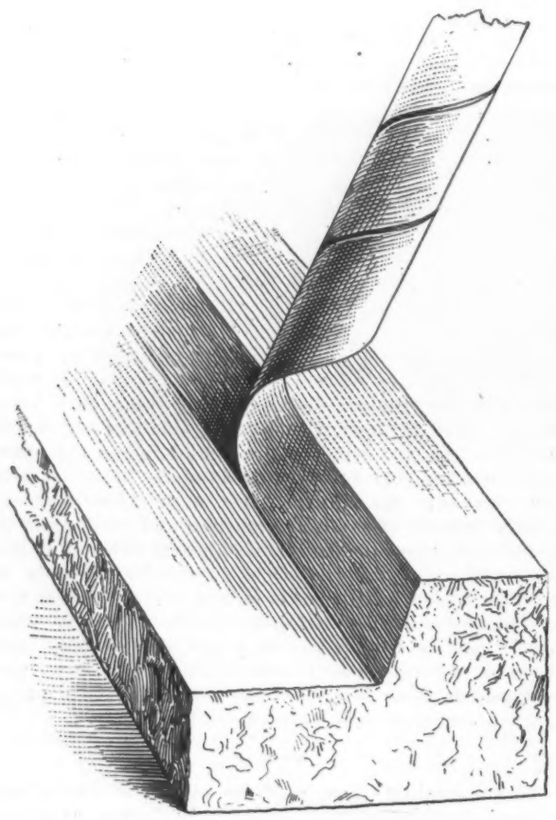


Fig. 1.—A Planer Chip Taken from a Close Grain Casting.

of opinion concerning hard cylinders, and the writer is one who has found by experience that something else is required. In substantiation of this the following cases are cited. A complaint came to the shop of a steam engine builder that the iron in the cylinders was too soft. An order was sent to the foundry to make the cylinders hard. Two were made, and it required 12 days to bore one of them. That was about 21 years ago and it was the last of hard cylinders in that shop. In another case, an old cylinder of about 40-inch bore was received in a carload of scrap iron. The cylinder came from an old power plant, where the engine had been in operation for about 40 years. A careful examination showed no sign of its ever having been rebored. The bore was as smooth and polished as a mirror. A piece of it was broken off and taken to a planer in the shop to test the quality of the iron of which the cylinder was made. When a cut was taken about ⅜-inch deep the chip curled up almost like wrought iron, as shown in the sketch, Fig. 1. There was no sign of its being a hard casting, but it was of a very close grain, showing that careful attention had been given to the mixture. It is significant that the engine was designed and built for a blast furnace, where a chemist is always employed.

Another case which came to the writer's notice was that of a pair of cylinders on a locomotive, which were hard in the true sense of the word. It was next to impossible to face the valve seats with a hammer and cold chisel, and in every case of refacing about three or four files were used up. The engine came in so often to have the valves refaced that the cylinders were consigned to the scrap heap and new ones of softer iron fitted in their place.

It is common to speak of iron as "soft" and "hard," but these words do not best describe its condition. A better phrase would be a "proper" or "improper" mixture, and the chemist should be the authority. The engineer furnishes the information that the cylinder should continue in service 20 or 30 years, with piston and valves operating under a steam pressure of 40 to 250 pounds, or that they should stand up under a coal gas pressure of 300 pounds, with the probability of a limited supply of lubricant. The lubricant itself should be placed under the watchful care of the chemist, lest the flash point prove a dangerous element in the cylinder of a gas engine, and also in the gas cylinders of a refrigerating machine.

Care should be taken in selecting the facing used in the foundry when making the mold, in order to produce a perfect finish. If the facing is not made up of the proper elements there is danger of defective sections being produced in the cylinder bore. They appear in dark shaded patches and often condemn a cylinder casting from the fact that a soft spongy nature is imparted to the surface. This spongy surface often enters into the iron to a depth of from ⅜ to ⅝ inch, and to clean it out cuts away the best part of the surrounding iron. The internal walls of the cylinder should be as perfect as possible, as the slightest defect will often cause cutting to start.

A company manufacturing a line of steam machinery calling for hundreds of small cylinders found at times about 75 per cent. of them defective from imperfections in the bore. It was necessary to make the cylinders as light as possible, and there seemed some element in the mixture that caused the excess of defective work. The chemist was consulted and a change was made that discarded one brand of iron that seemed to be poor on account of the presence of sulphur. After that the loss of castings was only about 5 per cent.

Where machine steel enters into the construction of a shop product it is also necessary to have the advice of a chemist, that the material may have proper strength and machine economically. The author's experience while he was engaged in selecting material for the detail parts of a shop's product supports this statement. As an example there was a piece to be finished in a monitor or turret lathe, the stock for which had not been purchased with rapid machining in view. After completing the special tools for the job the first operation was started. A cutting speed of about 160 feet per minute, with a stream of oil as a lubricant, was expected, but it was found impossible. A sample of the chip was sent to the chemist and the result was what was anticipated. The analysis was as follows:

	Per cent.
Carbon	0.41
Silicon	0.21
Sulphur	0.083
Phosphorus	0.051
Manganese	0.62

From material on hand another bar was selected that proved much better stock for the machining, and it was found that the piece could be produced in a satisfactory time. A sample lot of chips from this bar gave the following analysis:

	Per cent.
Carbon	0.15
Silicon	0.07
Sulphur	0.054
Phosphorus	0.039
Manganese	0.41

From this it might be concluded that the softer the steel the better the result, but this is true only to a certain extent. If the carbon is too low the stock will not machine well. If it is of a stringy nature it will clog the cutters and fill up the dies in cutting threads on bolts and studs and in tapping. Another lot of work consisted of

a large number of hexagon nuts, running in diameter from 2 to 6 inches. No trouble was experienced in the forging and the stock behaved well in the fire and under the hammer, but in the drilling and tapping, especially the latter, there was considerable trouble. The threads would tear out, as indicated in Fig. 2, and the tap would often stick fast in the nut so that the latter had to be cut off, as the tap could not be moved ahead or back without danger of breaking. The loss from this would often reach 80 per cent., and the tool makers stated that they had changed the shape of the tap in every way conceivable, but without result. The chemist found the following analysis, and again it was necessary to change the elements:

	Per cent.
Carbon	0.31
Silicon	0.29
Sulphur	0.043
Phosphorus	0.041
Manganese	0.47

A new lot of nuts was forged and the trial proved that the change in the stock was all that was necessary. With the same tap and under the same treatment in the machining, the nuts came out with perfect threads and with

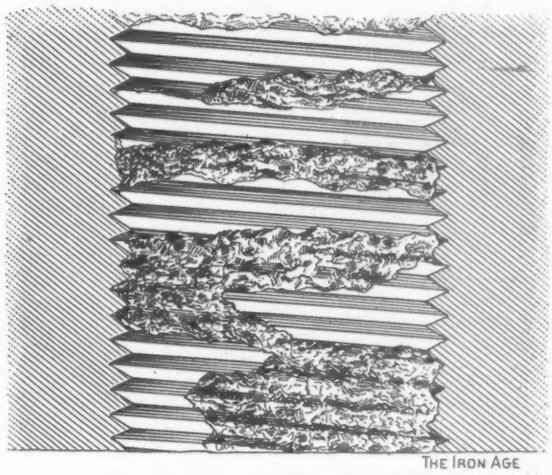


Fig. 2.—Section of a Nut, Showing Threads Broken in Tapping Because the Steel Was Too Hard.

a loss of less than 2 per cent. The following is the analysis that removed the trouble:

	Per cent.
Carbon	0.14
Silicon	0.073
Sulphur	0.054
Phosphorus	0.038
Manganese	0.41

When there are a number of detail parts to be finished for regular shop product it is a good plan to have them tabulated and the analyses entered opposite each piece. A copy of this should be kept in the purchasing department, so that when new material is ordered the analysis can be specified, and when the stock is received the chemist should analyze it before it is placed in the stores. The stock should also be marked with some character or letter, which should be entered with the records above mentioned. There are so many details to make up, and the range of analysis is so great, that unless a system similar to the above is adopted there is danger of getting stock that is too hard or too soft.

Another important part in connection with steam or gas engines is the foundation bolt. The analysis of the stock should be recorded in every case where a lot of bolts are to be made up. In an instance of a bolt breaking in tightening down on the bedplate of a large engine, it was found that the break was nearly as square as if it had been cut off in a lathe, and the analysis showed that the stock was not at all suitable for this work.

	Per cent.
Carbon	0.21
Silicon	0.13
Sulphur	0.063
Phosphorus	0.183
Manganese	0.31

Without doubt the element phosphorus was the cause of the accident. The following analysis has been found very satisfactory for bolts of this class:

	Per cent.
Carbon	0.6
Silicon	0.11
Sulphur	0.051
Phosphorus	0.042
Manganese	0.19

If they are properly proportioned there will be no danger of breakage.

If there is a lower percentage of the metalloids, as in dead soft steel, the bolts are liable to stretch. A case of this kind occurred with a bolt about 1 inch diameter

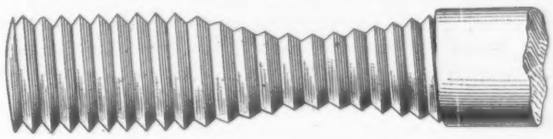


Fig. 3.—How a Bolt of Dead Soft Steel Will Stretch.

where it was to hold a clamp. The operator claimed that he could not keep the nut from working loose. After examination it was found that the bolt had assumed a condition shown in Fig. 3, by stretching.

Another result of stock being too hard is that a defective thread is formed because the operator cannot force the dies on the bolt to suit the pitch and the dies do not get sufficient hold to carry them ahead. The end of the thread is, therefore, very imperfect, and the bolt is thrown into the scrap. Where stock of this kind is to be threaded a lead screw should be used to force the dies ahead to suit the pitch. The lead screw is just as important when the stock is too soft and it is desired to cut a long thread on a bolt or stud. Without the lead screw the full thread part of the die must be made use of in forcing itself ahead on the full diameter of the bolt. This will stretch the bolt, and the pitch of the thread will be changed about as indicated in Fig. 4, and so much that the nut cannot be forced on.

It is not to be expected that all stock will be selected for rapid production in the machine tools in the light of monitor work, such as referred to above, as great care must be taken in selecting stock for those parts of machines where durability is the important factor. For example, a hot crank pin was the cause that led to an investigation which resulted in a whole shaft being returned to the shop, and a sample of chips taken from the

Fig. 4.—The Change in Pitch from the Stretching of Soft Stock in Tapping.

pin proved that it was the material that caused the trouble, as the chemist found in the following analysis:

	Per cent.
Carbon	0.19
Silicon	0.14
Sulphur	0.031
Phosphorus	0.044
Manganese	0.47

This steel was very much too low in both carbon and manganese. A new pin was substituted, having the following analysis, which proved successful:

	Per cent.
Carbon	0.46
Silicon	0.10
Sulphur	0.049
Phosphorus	0.038
Manganese	0.61

A few experiences of this kind would pay the expenses of a chemist for a whole year, to say nothing of avoiding the dissatisfaction of customers, which often means loss of business.

There are other troubles that arise from soft steel in the crank and cross head pins, and also in valve pins. In the cross head pin, if the material is soft, the bearing is reduced from wear and forms a shoulder at each end. As a result it is very troublesome to remove the pin on

account of the shoulder coming in contact with the edges of the brass boxes, and, further, the reduction in diameter soon reduces the surface of the pin below what is required for the duty it has to perform. A common condition in a crank pin made of soft steel is that the surface becomes cut to such an extent that oil will not flow properly over its surface and heating is caused.

The wear on valve stems, aggravated examples of which are shown in Fig. 5, causes a great deal of trouble in keeping the stuffing boxes tight. Frequently, too, a shoulder will be formed, which, coming against the packing of the stuffing box, causes an unsteady motion of the governor and results in poor regulation. This defect in the piston rod is the cause of a great waste of packing, on account of the uneven surface of the rod destroying the rings. A few years ago the writer's notice was called to a piston rod that had been in use less than one year and was reduced nearly ⅛ inch in diameter. A new one,

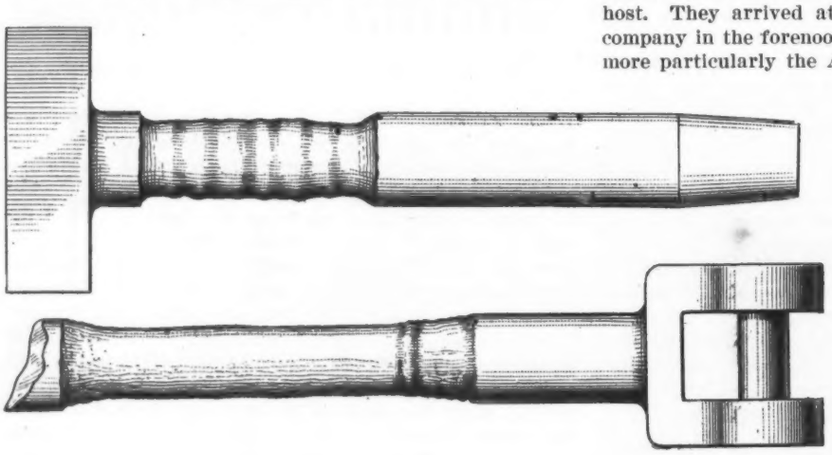


Fig. 5.—Excessive Wear on Valve Stems, the Result of Poorly Selected Material.

with analysis as follows, was put in, and the rod is still in use:

	Per cent.
Carbon	0.43
Silicon	0.11
Sulphur	0.036
Phosphorus	0.039
Manganese	0.51

For valve stems the manganese should be fairly high. The following analysis seems to give very good results:

	Per cent.
Carbon	0.33
Silicon	0.10
Sulphur	0.047
Phosphorus	0.049
Manganese	1.03

The surface is hard from the manganese and will stand the wear of packing.

The same attention to the analyses of stock should be given in the construction of all machinery,—steam engines, rolling mills, printing presses, sewing machines, and even watches. It will not only add to the life of the finished machine, but will mean a reduced cost to the manufacturer.

According to recent German statistics, the total length of the railroads of the world is 537,105 miles, of which 270,386 miles are in America (a little more than half), 187,776 miles in Europe, 46,592 miles in Asia, 15,649 in Africa and 16,702 in Australasia. Except for the United States, which has about 211,000 miles, no one nation has as much as 35,000 miles. Germany has 34,016 miles; Russia, 33,286; France, 28,266; Austria, 24,261; United Kingdom, 22,592; India, about 26,000, and others smaller amounts. Rolling stock is given as: Locomotives, 150,000; passenger cars, 225,000; freight cars of all descriptions, 3,000,000. European roads are very expensively built, the average cost per mile being placed at $107,600, as against $59,700 for the rest of the world. As a result, the European valuation, $22,000,000,000, is more than half of the total, $43,000,000,000.

The Eastern Pig Iron Association.

The Eastern Pig Iron Association is an organization of a number of furnace companies in the Lehigh and Schuylkill valleys and in New York and New Jersey, which meets monthly to discuss matters relating to the industry and to interchange statistical data. Two out of three meetings are held in Philadelphia and one in New York, the members usually being the guests of one of their number. Last year the association accepted the invitation of the Central Iron & Steel Company to hold one of its monthly meetings at Harrisburg, Pa., and on another occasion the members spent a few days on Lake Champlain as guests of Witherbee, Sherman & Co. and Pilling & Crane.

The May meeting, which was held last Wednesday, brought the members and invited guests to the plant and mines of the Thomas Iron Company, which acted as host. They arrived at the Hokendauqua works of the company in the forenoon and visited the plant, inspecting more particularly the Allis blowing engine and the electrical pumping plant, among those present being B. F. Fackenthal, Jr., president of the Thomas Iron Company, and other officers of the company; Edgar S. Cook, president of the Warwick Iron & Steel Company; James Bailey and Frank F. Amsden of the Central Iron & Steel Company; Leonard Peckitt, president of the Empire Iron & Steel Company; A. Fowler of Rogers, Brown & Co.; T. I. Crane of Pilling & Crane; Frank S. Witherbee and Lewis W. Francis of Witherbee, Sherman & Co., and F. E. Bachman of the Northern Iron Company. Among the guests were James Gayley and W. B. Dickson, vice-presidents of the United States Steel Corporation; N. B. Wittman, W. H. Hulick of the Warren Foundry & Machine Company, and Frank C. Roberts and Philip S. Wright of Philadelphia. After luncheon a special train of the New Jersey Central Railroad carried the party to the famous Richard mine of the Thomas Iron Company, located in Morris County, N. J., 2½ miles north of Dover. This mine has shipped since its purchase by the Thomas Iron Company, on October 30, 1856, to May 1, 1906, a total of 2,419,734 tons, and is now averaging 100,000 tons per annum. The ore in sight has been estimated within the last year by a competent outside mining engineer at upward of 2,000,000 tons. The company is working two parallel veins, about 300 feet apart, the Mount Pleasant and the Richard. Since 1900 a comprehensive remodeling of the surface plant has been in progress and is now practically completed. It includes the installation of a Babcock & Wilcox battery of boilers of 1250 horse-power, an Ingersoll compressor with compound Corliss engines, two General Electric six-pole 150-kw. compound railroad generators directly connected to Harrisburg engines, three electric hoists, electrically driven crushers, Robins conveyors and two Jeanesville pumps capable each of handling 1,000,000 gallons of water per 24 hours with a vertical lift of 685 feet. The party also visited the Wharton furnaces at Wharton, N. J., under the guidance of Edward Kelly, the general manager.

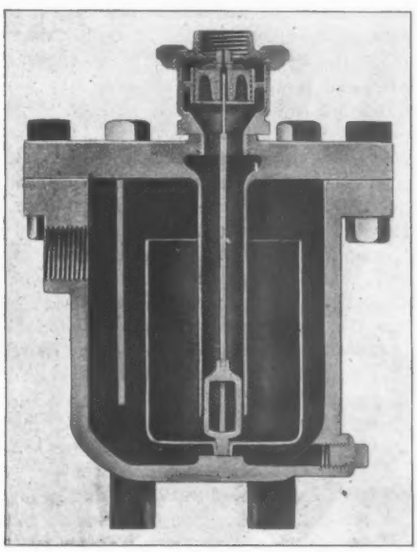
The Worth Brothers Company, Coatesville, Pa., has completed, and is about to put into operation, another 3-high 132-inch plate mill, containing all modern appliances, such as tables, straightening rolls, guillotine shears, &c. This will add several thousand tons per week to the company's producing capacity. The open hearth steel plant has also been enlarged by the addition of two 50-ton basic furnaces. Two of the company's older plate mills—the 132-inch and the 90-inch—will be rebuilt and completely modernized in the very near future.

The Greenaway Steam Trap.

Simple construction, positive action and a design that can be relied upon under all conditions of pressure and quality of entrained water are the three most essential requirements of a commercially successful steam trap. To meet these the Greenaway Company, Detroit, Mich., has designed and is manufacturing a steam trap of unusual and rather exclusive features.

Referring to the accompanying cross sectional view, it will be noted that the trap is extremely simple, involving only a few operating parts, and no diaphragm levers, toggles and floats. The trap consists essentially of a substantial cast iron casing and cover, a brass valve chamber, steam actuated valve and a renewable valve seat, valve stem, valve stem guide and copper bucket.

Water of condensation flows into the receiving chamber through the left side port opening, and filling the chamber causes the copper bucket to float, which action closes the auxiliary and main discharge valves in the top



Section of the Steam Trap Manufactured by the Greenaway Company, Detroit, Mich.

of the trap. It will be noted that the discharge valve is entirely unrestricted in its movements, being actuated by the vertical valve stem through the indirect influence of the steam pressure. The rising condensation overflows the copper bucket, which sinks and opens the small auxiliary balance valve. The resultant equalization of pressure on each side of the main discharge valve causes the valve to open, allowing the steam pressure to force the accumulated water out of the trap. The action of the valve is instantaneous, giving a full bore opening with each discharge and eliminating, it is claimed, the usual destructive action of wire drawing. A water seal prevents the escape of steam.

One of the distinctive features of the trap is its exceptionally large capacity. One valve is suitable for all pressures up to and including 200 pounds. The trap will work under pressures of from ½ to 300 pounds.

For a number of purposes for which the telephone and telegraph have previously been employed, the telautograph is gradually coming into use. The Pennsylvania Railroad management thinks enough of the device to use it in the terminals in Pittsburgh and St. Louis for announcing the arrival and departure of trains. A number of banks employ it to enable the paying teller to ascertain from the bookkeeping department the condition of a depositor's balance; similar use is made of it by large business houses for furnishing quietly information about a customer's credit. It is employed by an electric supply company in Philadelphia for sending meter readings to the bookkeepers. In modern systems of fortifications it finds a use in communicating training orders from range-finding stations to the gun pits.

The Western Electric Company's Hawthorne Works.

Supplementary to the description of the new Hawthorne Works of the Western Electric Company, Chicago, given on page 1686 of our last issue, the following observations regarding some of the machines driven by individual motors will be found suggestive:

There are several interesting examples of individual machine drives throughout the shops. The forge shop is equipped with electrically driven cold saw, shears, bull-dozer, blowers for forges and two cutting off machines. In the machine shop is an E. W. Bliss No. 5 press driven by a 5 horse-power motor mounted on top of the press frame and direct geared to the machine through an internal gear on the fly wheel which meshes with a pinion on the motor. The driving motor of one of the several sheet iron shears in the machine shop is of the protected type, delivering 2 horse-power. It is mounted in an inverted position on the under side of the machine table, and is direct geared through a rawhide back gear to the main driving shaft of the machine. There is also a Springfield surface grinder in this shop, the main motor of which is 2 horse-power. It has a pulley at each end, both of which are belted to the spindle of the grinding wheel. The motor is mounted on the grinder head and travels with it across the work. On about the same level with the main motor, behind the housings, is an auxiliary motor mounted on a bracket direct geared through an internal gear to the shaft which carries the open and cross belts for the reversible bed travel of the machine.

Among the large machine tools located in this shop are a Dietrick & Harvey open side planer, 120 inches by 24 feet, driven by a 40 horse-power open type motor. The motor is mounted on a bracket on a housing high enough to be out of the way, and is belted to the countershaft on the machine. There is also a 3 horse-power motor on top of the housings, which serves to raise and lower the cross head. A large Niles extension boring mill has its main motor rated at 10 horse-power below the floor, and drives the mill through spur gearing. A small auxiliary motor of 3 horse-power capacity is mounted on the bed of the machine, and is geared to the traversing screws for raising and lowering the cross heads for traversing the housings. Eight Gisholt turret lathes are operated by 5 horse-power variable speed motors. On the rear of the bed below the head stock they have small auxiliary motors for traversing the turret. A single-head traverse shaper is direct geared to a protected type 1½ horse-power 4 to 1 variable speed motor. A considerable speed reduction is obtained by a back gear which is within the gear case. A drum type controller is actuated by the cord passing twice around a drum on its shaft, and also around a drum on a splined shaft on top of the machine which carries two hand wheels, one at the right hand end of the machine and the other on the shaper carriage. A Brown & Sharpe surface grinder has its motor mounted inside of the pedestal, and a belt passes around it to the set of counterweighted pulleys on the grinder spindle. In this way the grinder may be raised or lowered to suit the hight of work while maintaining the proper belt tension for all positions. Among the portable tools is a large boring and drilling machine manufactured by the Newton Machine Tool Works. It is entirely self contained, being provided with an arc lamp, as well as motors for power. It has two heavy stirrups, one at each side of the frame near the top, so that it may be easily picked up and carried about by the traveling crane. All the motors, with one or two exceptions, are provided with Cutler-Hammer self starters, mounted in an asbestos lined case with glass doors. The automatic starter is connected by a snap switch in the most accessible place that can be found for it on the machine.

A New Veeder Tachometer.

The Veeder form C tachometer is a portable instrument for indicating revolutions per minute of motors, generators, shafting, &c., and is made by the Veeder Mfg. Company, Hartford, Conn. The readings are shown by the hight of a column of liquid in the indicator tube in connection with a graduated scale. The liquid consists of pure alcohol colored with aniline dye. The only moving part in the instrument is the paddle wheel in the centrifugal pump, which constitutes the lower part of the instrument. When the paddle wheel is revolved centrifugal force draws the liquid from a reservoir and forces it up in the indicator. The bottom of the reservoir communicates with the center of the pump, and from the periphery of the pump there are passages to the indicator tube.

The vertical hight between the surface of the liquid in the indicator tube and that in the reservoir will be approximately proportional to the square of the speed of revolution. The reservoir is concentric with the indicator tube, so that a slight inclination does not vary the level of the liquid in the tube. The small handle at the front of the instrument may be used for throttling the passage from the pump to the indicator, to prevent the vibration of the column of liquid due to sudden fluctuation in the speed. Thus, if desired, the readings may be made "dead beat." A displacement plunger is provided for adjusting the zero level of the liquid.

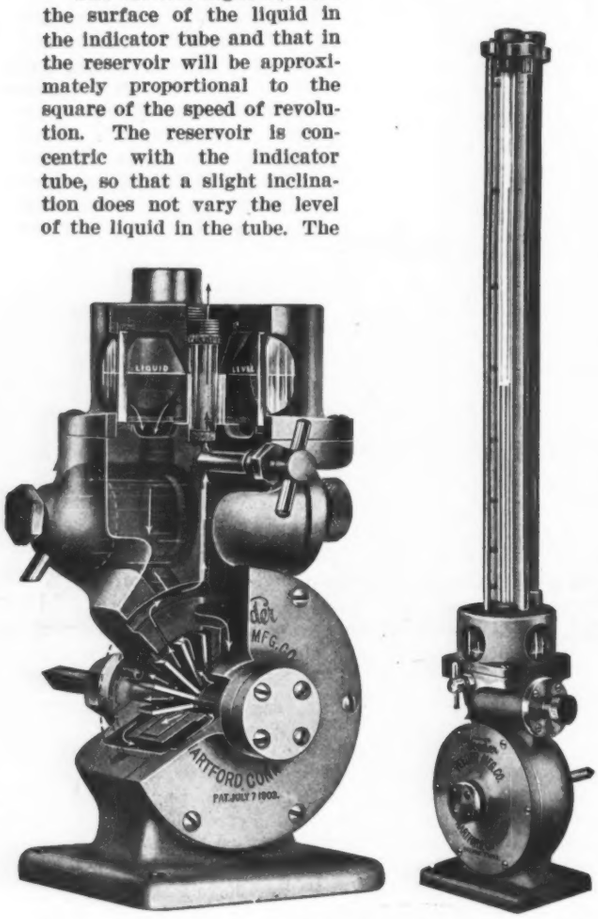


Fig. 1.—A Broken Out View of the Mechanism and the Complete Veeder Form C Tachometer—Fig. 2.

The cut away view of the form C tachometer, Fig. 1, shows the course of the liquid when the instrument is in operation. From the reservoir the liquid flows down through the chamber where the displacement plug is located into the space surrounding the pump chamber. Passages conduct the liquid to both sides of the pump casing. When the pump paddle is revolved the liquid enters the pump chamber through four small apertures on each side of the casing, close to the shaft. The centrifugal action of the paddle wheel whirls the liquid from the center to the periphery of the pump chamber, forcing it out through a number of small passages into the equalizing ring, thence up through the throttle or choke valve into the indicator tube, Fig. 2, the rise being dependent upon the speed at which the paddle is revolved.

The construction provides against any inaccuracy of the reading due to the wear of bearings. Even if, through long usage and wear of the bearings, the paddle or shaft were to become eccentric or displaced in the case the accuracy of the readings would be unaffected, since the equalizing ring passages would compensate the irregularities. As the wear of the hardened steel shaft in its bearings is the only mechanical wear to which the instrument is subjected, no spring being employed, it will be seen that with the elaborate provision made for such wear as may occur long service will not lessen the trustworthiness of the readings.

The standard length of scale is 12 inches for fixed maximum readings of 500, 1000, 1500, 2000 or 2500 revolutions per minute, respectively. When the form C tachometer is intended for general use a ball thrust bearing is provided on the end of the shaft.

The Battle Ship Contest Won by the Private Builder.

More than ordinary interest was attached to the delivery to the Government on May 22, at Norfolk, of the completed battle ship Louisiana, a 16,000 ton vessel, built by the Newport News Shipbuilding & Dry Dock Company, because of the fact that it marked a victory for the contracting corporation in a contest, which has been going on for more than three years, to determine whether the Government could build a war ship as quickly and at as little cost as it could be built in a private yard. A month after the keel of the Louisiana was laid down at Newport News, Va., the work of building the Connecticut, a sister ship, was begun at the Brooklyn Navy Yard, and although naval and Government officials used every effort to complete the Connecticut within the same length of time as that taken to build the Louisiana, it will be several months until the Connecticut will be ready for service. In addition to the longer time taken by the Government in building the Connecticut, more money has already been spent on that vessel than the total cost of the Louisiana, the cost of the latter aggregating $3,992,000, while the Connecticut has already cost $4,212,000, and Congress has been asked for an additional appropriation of $380,000 to complete the boat.

On February 7, 1903, the work of building the Louisiana was started, and exactly a month later the Connecticut was begun. The Louisiana was launched August 27, 1904, and on September 29 the Connecticut was put in the water. The additional work of completion on the Louisiana proceeded much more rapidly, and the question of when the Connecticut will be finished is still a matter of doubt, but it is admitted that it will probably be several months. The hull of the Louisiana is 450 feet long on load water line, and it has a 76 foot 8 inch beam measured to the outside of the plating. The draft on normal displacement of 16,000 tons is 24 feet 6 inches and the speed of the vessel is 18 knots. The boat is fitted with two sets of vertical, inverted, triple expansion, direct acting, propelling engines designed for 16,500 collective horse power at 120 revolutions a minute. Each engine is placed in a separate water-tight compartment and steam at 265 pounds pressure is supplied from 12 Babcock & Wilcox boilers, placed in six water-tight compartments. The total grate surface of the 12 boilers is 1100 square feet, and the total heating surface 52,750 square feet.

Nineteen bridge companies and agents were indicted by the Allen County grand jury, at Lima, Ohio, May 26. Thirty-four indictments in all were returned. Two indictments each were returned against ex-county commissioners. Conditions in Allen County, because of the operation of the bridge combination, are reported by the grand jury as even worse than expected. The exposures show that the county paid from three to five times what should have been the ordinary cost of bridges, owing to collusion between the bridge companies, when making bids.

The New Russian Metal Duties.

On March 1, 1906, the new Russian customs tariff, as modified by the commercial treaties with Germany and France, became operative, superseding the tariff formerly in force. The new tariff differs in many respects from the tentative general tariff which was drafted primarily as a basis of negotiations with the treaty powers. Thus, for instance, the differentiation in rates on goods entering by sea and by the western frontiers, with the supposed idea of granting a special measure of protection to the Baltic and Black Sea ports, is abolished as a concession to Germany, and the goods entering by way of the western frontier of Russia pay the same rate of duty as those entering Russia by sea. There are also a number of concessions granted to both Germany and France, and by virtue of the most favored nation treatment which has been again accorded to American goods since the abolition of the discriminating duties in connection with the sugar controversy the new conventional tariff of Russia will apply to the American products.

The most important items from this tariff dealing with manufactures of metal are quoted below. Owing to a rearrangement of classification, the corresponding rates charged under the old tariff cannot be given in every case, but in such instances the paragraph of the old tariff is quoted in full.

1 pood is roughly equal to 36 pounds.

1 ruble is equal to 51½ cents.

Section.	Classification under new tariff.	New conventional duties. Per pood.	Old rate of duties. Per pood.
140.	Manufactured iron:		
	1. Bar and assorted iron of all kinds, except that mentioned below; ingots, puddled billets, scrap and mill bars; iron in powder	R 0.75	R 0.75
	2. Iron rails, even though perforated and grooved	R 0.90	R 0.75
	3. Sheet iron of all kinds, of thickness of ½ mm. or more (No. 25 Birmingham gauge), iron slabs up to 18 inches wide, assorted iron of all kinds up to 18 inches wide or 7 inches high, tee iron and similar iron, excepting angle iron, which goes under subdivision 1 of this section	R 1.05	R 0.97½
	4. Sheet iron of thickness below No. 25 Birmingham gauge	R 1.50	R 1.20
141.	Tin plate (tinned sheet iron), lacquered or not, stamped with designs or crystallized, sheet iron painted, varnished, coated with zinc, copper, nickel or other common metals	R 2.65	R 2.32½
142.	Steel:		
	1. In bars, and assorted steel of all kinds, except that mentioned below, billets and scrap	R 0.75	R 0.75
	2. Steel rails, even perforated and grooved	R 0.90	R 0.75
	Paragraphs 3 and 4 read same as paragraphs 3 and 4 of section 140, substituting "steel" for "iron."		
143.	Copper, aluminum, nickel, cobalt and other metals not specially designated, German silver, Britannia metal and other not specially named alloys:		
	1. In pigs, ingots, shavings, scrap, powder	R 5.00	R 3.75
	2. In bars, rods, sheets, even if polished:		
	½ mm. thick and over	R 6.00	R 4.65
	Less than ½ mm. thick, down to 1-3 mm	R 6.40	
	Less than 1-3 mm. thick	R 7.10	
149.	Manufactures of copper and copper alloys:		
	1. Burners of lamps (not separately rated before)	R 9.00	
	2. Articles not ornamented in relief nor engraved or stamped:		
	a. Weighing over 5 funts (4½ pounds) each	R 8.00	R 6.48
	b. Weighing 5 funts (4½ pounds) or less, each	R 9.00	R 6.48
	3. Articles ornamented in relief or engraved, but not stamped; also busts, statues, &c.	R 21.00	R 20.40
150.	Cast iron wares:		
	1. Iron castings in the rough	R 0.90	R 0.90
	2. Cast iron vessels, enameled	R 1.50	R 1.50
	3. Cast iron wares, wrought, turned, polished, ground, enameled (except vessels), zincked, &c.	R 4.20	R 2.10
151.	Iron and steel manufactures (including malleable iron manufactures), forged, molded, not filed except on the sides and edges, forged nails	R 2.10	R 2.10
152.	Iron and steel boilermakers' work, pipes and connection of iron and steel:		
	1. Steam boiler and similar apparatus.	R 2.10	R 2.10
	Boiler makers' wares, reservoirs, tanks, sections of bridges, all manufactures of sheet iron and steel not specially named	R 2.55	R 2.10
	2. Pipes of all kinds also connecting parts:		
	a. Exceeding 5 funts (4½ pounds) in weight, each	R 2.55	R 2.10
	b. Five funts (4½ pounds) in weight each or less	R 4.05	R 2.10
153.	Iron and steel manufactures, &c., those specially named, wrought, turned, polished, zincked, &c.:		
	1. All kinds, &c., those mentioned in subdivision 2 following	R 4.20	R 2.10* / R 3.30†
	2. Padlocks, mortise locks, screws for wood	R 6.00	R 6.00
154.	Tin plate manufactures and sheet iron manufactures coated with varnish, enamel, common metals, paint	R 4.00	R 3.37½
	2. Same as above, gilt or embellished.	R 9.00	R 9.00
155, 156.	Wire and manufactures of wire, various increases, according to diameter of wire.		
157.	Sewing needles (per funt or 9-10 pound).	R 1.20	R 0.97½
	Needles for sewing machines (per funt or 9-10 pound)	R 2.00	R 0.97½
158.	Cutlery, slight changes, except as follows:		
	3. Shears for sheep shearing	R 7.50	R 1.65
160.	Scythes, bills and sickles	R 3.00	R 1.65
161.	Files, rasps, screw stocks, taps and dies.	R 2.50	R 1.65
162.	1. Type and matrices of all kinds	R 9.00	R 0.60
	2. Matrix punches, brass lines, &c.	R 25.30	R 0.60
164.	Manufactures of lead, excepting those under paragraph 162; shot	R 2.10	R 1.50
	MACHINES AND APPARATUS.		
	(Owing to an entirely new classification it is not practicable to compare the entire divisions in each case.)		
167.	1. Machines of cast iron, wrought iron and steel, even if combined with copper to an extent not exceeding 25 per cent. of total weight of machine:		
	a. Not specially mentioned	R 2.10	R 2.10
	b. Gas and petrol motors, steam engines, portable engines, except those mentioned in subdivision 5, locomotives, locomotive steam wagons, steam trolleys and electro-motor wagons, printing and lithographic machines, paper making machines, wood working machines (frame saws pay 2.10 per pood), pumps and portable fire engines, compressors, ice making and refrigerating machines, sewing machines	R 3.20	‡R 2.10
	Gas and water meters	R 4.20	R 2.10
	c. Metal working machines	R 4.20	R 2.10
	Steam fire engines	R 4.20	R 2.70
	2. All kinds of machines of copper and alloys, or with such metals in extent of 25 per cent. and over of total weight of machine	R 8.00	R 6.48
	3. Dynamo-electrical machines and electro-motors of all kinds, electrical transformers	R 8.50	R 2.10
	4. Agricultural machines without steam motors, not specially named.	R 0.75	R 0.75
169.	Manometers, electrical switches, rheostats, telegraph and telephone apparatus, electrical and pneumatic bells and accessories for electric signaling	R 9.00	R 10.20
	2. Electro-technical measuring appliances	R 12.00	R 10.20
	3. Electrical incandescent lamps:		
	a. Mounted	R 30.00	R 9.00
	b. Unmounted	R 60.00	R 9.00

* If weighing over 5 funts (4½ pounds) each.

† If weighing 5 funts each or less.

‡ The old classification was "gas, hot air and petrol motors, sewing and knitting machines, portable engines not specially mentioned, tenders and fire engines, excepting steam."

Iron and Steel Bounties in Canada.

TORONTO, May 26, 1906.—Canada's bounties on iron and steel were the subject of a discussion in the House of Commons on Monday. The matter was brought up by James Conmee, one of the representatives of New Ontario, in the following resolution, of which notice had been standing for some time:

Whereas, the acts granting certain bonuses upon metals manufactured in Canada have stimulated the production of iron and steel, as evidenced by the several metallurgical works now in operation and in course of construction; and whereas, it is important that our mines should be opened up and that Canadian furnaces be supplied with Canadian ore; and whereas, under existing legislation a bounty is paid upon iron and steel produced by Canadian furnaces from foreign ore, it is the opinion of this house that it will be in the public interest that all bonuses hereafter paid be confined to Canadian ore and iron and steel produced therefrom, and that the bonuses hitherto granted for the encouragement of the iron and steel industry should be renewed for a further period, subject to the provisions of this resolution, and that the duty be remitted upon coal coked in Canada and used for smelting purposes.

It was apparently not Mr. Conmee's intention to press this resolution, for at the conclusion of the discussion to which it gave rise he withdrew it, remarking that the object he had in view at this stage was to evoke expressions of opinion on the part of members who take any interest in the question. It is easy to understand why he should refrain from bringing the matter to a vote. In the first place, as an influential New Ontario supporter of the Government, he would be averse to forcing its hand. In the second place, it must have been apparent to him that, whatever intentions the Government may have on the subject, it might deem it inexpedient to have the House declare itself in favor of his resolution just now; hence, it might let it be understood that it wished its majority to oppose the resolution. In the third place, the sense of the House, as indicated by the speeches, was in favor of continuing the bounties, if not unanimous in favor of restricting them to the products of Canadian ore. In the fourth place, the whole tariff question, with its related issues, is to be taken up in the sessions to be called specially for that purpose in November.

Would Favor Canadian Ore Mining Interests.

In support of his resolution Mr. Conmee spoke of the prosperity that has come to the country in consequence of the establishment of the smelting industry in Canada. It was unfortunate that the product of some of these furnaces was almost entirely from foreign ore. In readjusting the bounties it would appear to be in the interests of the country that the greatest possible inducement should be given to the miner to produce Canadian ore and to the furnaces to turn out the products of Canadian ore. There could be no question it was in the interests of Canada to continue to pay bounties, but in readjusting the bounties encouragement should be given to smelt Canadian ores, thus stimulating the development of Canadian mines.

Mr. Johnston (Cape Breton) said that up to 1896 the iron and steel industry of Canada was languishing, but under the legislation of this Government it had developed into great importance. He regretted that Mr. Conmee had seen fit to amend his resolution by excluding from the bonus the ores of any British colony, for the reason that in Nova Scotia they were compelled to use a large quantity of Newfoundland ore. He asked Mr. Conmee to reconsider his decision to exclude Newfoundland ores, on the ground that it was inopportune to take such action at this stage. He opposed the proposal to admit coal for coking in Canada for smelting purposes free, as injurious to the coal interests of Nova Scotia.

In its original form, as mentioned by Mr. Johnston, the resolution included ores from any part of the British Empire as eligible for the bounties, but Mr. Conmee afterward changed this. Were the Government to leave the bounties extended to the Canadian product of all ores mined under the British flag and withdraw them from the Canadian product of ores mined in other countries the effect would be discriminating as between the two chief centers of the iron and steel industry—Cape Breton and Sault Ste. Marie. The ore used in both these centers comes mainly from sources outside of Canada, the Cape Breton works using Newfoundland ore and the Sault Ste. Marie works using Minnesota ore. Were the product of ores from British sources to be entitled to the bounties, and the product of ores from non-British sources not to be, the works in Cape Breton would be benefited and the works at Sault Ste. Marie injured. As Sault Ste. Marie is in New Ontario, Mr. Conmee probably shrank from advocating a policy that would hurt them while benefiting their rivals in eastern Canada. Hence, no doubt, he changed his resolution so as to confine the benefits of the bounties to Canadian ore, thus putting the New Ontario and the Cape Breton manufacturing interests on the same footing—that is to say, he made the resolution unacceptable to both. While Mr. Johnston opposed it from sympathy with the Cape Breton works in his riding, Mr. McCool opposed it from sympathy with the Sault Ste. Marie works, he also being a New Ontario man. He declared that it would be regrettable if the Government were to act on the resolution. He said that the Lake Superior Corporation had made every effort to get suitable ore in Ontario, but was obliged to go outside for it.

The Need of the Bounties.

The Minister of Customs, Mr. Paterson, said the bounties had been increased in order that the duty on the finished product might be reduced. He questioned if the iron and steel industry could have grown to anything like its present extent without the assistance of the bounties. The underlying principle of these, however, was, he said, to encourage the use of Canadian ore, but he felt that were the resolution to be acted on at once it would be disastrous to existing industries. He suggested that it be withdrawn.

Arch. Campbell complained that Canadian steel was being sold for export at lower prices than those current at home, and he suggested that if the bounties were continued provision should be made for the prevention of such differences.

It is perhaps not immaterial to mention that Thunder Bay and Rainy River region, the constituency which Mr. Conmee represents, has several important iron ranges and that the Atikokan Iron Company, which is building a furnace in Mr. Conmee's town (Port Arthur) intends to use the ores of mines in the Atikokan range. But the company's smelting operations will by no means suffice for the consumption of the output contemplated in its mining operations. It proposes to be a large shipper or ore, having in view, it is understood, a market on the United States side of the lakes, as the Lake Superior Corporation has for the output of its Helen mine. But if the bounties on iron and steel were confined to Canadian ore they might stimulate ingenuity to the invention of smelting processes for the utilization of the Rainy River and Thunder Bay ore in the manufacture of steel. It is pointed out that Alabama has become a steel manufacturing State in spite of all that was said of the unfitness of its ores for the making of steel. Naturally, Rainy River ore interests are ambitious to become the suppliers of the Sault Ste. Marie iron and steel works.

Others Favor the Conmee Policy.

Nor is the sentiment in favor of Mr. Conmee's policy confined to his own constituency. In eastern Canada there is a very decided feeling that the bounties should be restricted to the product of domestic ore. An exponent of that view is the Halifax *Chronicle*, a strong supporter of the Laurier Government. Its advocacy of the policy attracts the more attention because the present Finance Minister—the member of the Government who has most to say about duties and bounties—was formerly its editor. There are large iron deposits in Nova Scotia which are neglected, the *Chronicle* says, because of the extending of the bounty to the product of imported ore.

It is expected that the new mining act of Ontario, passed in the session of the Legislature just concluded, will have an effect to encourage prospecting, and may thus hasten the discovery of deposits of high grade hematite, if there are any in Ontario. A purely Canadian bounty would assist this tendency of the new law. So

indeed would any influence operating to make the country more self-dependent for ore supplies. Were the owners of iron mines in the United States, particularly in the Lake Superior district, to refuse to ship ore to Canada they would cause a ransacking of the earth in New Ontario for new sources of supply. Some years ago the Newfoundland Government entertained for a moment the idea of imposing an export duty on ore. This proposal caused anxiety to the Canadian importers of Newfoundland ore. Had it been acted on it would have been embarrassing to the two steel companies in Cape Breton.

C. A. C. J.

The Cause of the Recent Earthquake.

From an article in the New York *Evening Sun*, written by a correspondent at Oakland, Cal., the following extracts are taken:

What caused the earthquake of April 18? and Where did it come from? are question which, quite naturally, are being asked pretty generally out here. Never before has the opportunity for studying the geological disturbances which cause at least some earthquakes presented itself as in this case. Acting promptly and with the consent of the National Government, Governor Pardee appointed a State Earthquake Commission within a few days of the disaster. The commission is composed of Professors A. C. Lawson, chairman; A. O. Leuschener, secretary; G. K. Gilbert, Fielding Reid, John C. Branner, George Davidson, Charles Burkhalter, and W. W. Campbell. All are thoroughly conversant with the topography and geology of the coast. They met within the week of the earthquake, organized and laid out certain definite plans for work.

The mistake has been made very generally by the public of calling this the San Francisco earthquake, whereas it was felt over large areas of the State. It will be many weeks, if not months, before the commission is prepared to make a full and official report, but much general information has already been gathered, and doubtless most of it will be found eventually to correspond fairly with the final and official report.

It is interesting to note here that the records of the two previous severe shocks—those of 1868 and 1898—show the same general direction of motion. The fact that the large mains carrying water from the distant water sheds and reservoir to the city had been broken at once led to their inspection, and this directed the geologists to the section most interesting and promising most returns for careful study. This is what is known geologically as the San Bruno fault. Fortunately this has been a special object of study by Professor Branner for years, and he has explored and mapped and measured the fault for many miles and traced its almost unbroken course up and down the State. It can be traced for nearly 600 miles.

Sufficient is now known to demonstrate that the severe earthquake of April 18 was due to a sliding of the San Bruno fault for approximately 6 feet. Whether or not this was its original cause, or whether there was some antecedent jar that caused the sliding of the San Bruno fault, is not known, and, indeed, may never be fully explained.

Geological changes, more or less similar but of vastly greater magnitude, which have occurred in prehistoric times have resulted in the formation, along the axis of the San Bruno fault, of what is known as a structural valley. This valley, with its nestling lakes, San Andreas and Crystal Springs, and its excellent water sheds, was naturally taken by the Spring Valley Water Company many years ago for one of its principal sources of water supply for the city of San Francisco. Dams at the lower end of this natural valley impounded enormous quantities of water and transformed the valley of the San Bruno fault into a vast reservoir. From it the main aqueduct to the city was run.

Unfortunately for the city, these water mains were laid out so as to cross the San Bruno fault near the northern end of the structural valley at an angle of about 45 degrees. When the earthquake came nothing could save them. No matter what their construction might have been, the very great shifting which occurred would have produced the same result.

Everything on or near the line of this fault suffered severely. Stanford University was near it. Salinus city, nearly in its path, is laid waste. San Francisco lay somewhat to the north and east of the fault and suffered very severely in places. Here, in some localities the jelly like shaking was most marked, and wherever in the city was soft soil, or filled in land, there great damage resulted. On the other hand, the experience has demonstrated that even very large buildings may be built upon such soil, if the foundations are constructed with the nature of the soil and the liability to earthquakes ever in mind. For example, the Ferry Building is built on piles sunk in the mud of the bay, yet the floor of the building is perfectly level, and the building itself in all essentials is undamaged. But the foundations of the Ferry Building were put in to stay. There are 72 groups of 60 piles 80 feet long, driven down into the hard, blue clay. On top of these groups of piles concrete arches were built, and on these arches rests the Ferry Building, a structure of steel and cement. When the earthquake came this building, practically a solid mass from foundation to top, vibrated as a unit, and, except for the splitting off of some of the stone casing, is undamaged.

The lessons to be studied from the work of the Earthquake Commission, even so far as it has gone at the present time, seem clear. Earthquakes may occur at any time, owing to the same causes which have produced the three severe ones in the years noted. The main aqueducts of the Spring Valley Company or any other main water feeds should not cross the line of the San Bruno fault, but should be constructed to the east of it. No danger is to be anticipated where the principles of building solid foundations and properly keying buildings are followed. There is no reason why the city cannot be made not only earthquake proof, but also almost fireproof, if it be rebuilt on proper lines and with due thought to the great possibilities of the San Bruno fault.

The Amalgamated Scales.

In addition to the changes in the Amalgamated scales for the year commencing July 1, 1906, printed in *The Iron Age* of May 24, the scales for sheet mills, sheet mill hands and roughers and catchers were adopted. The base of the sheet mill scale for 1905-1906 was readopted. The United States standard gauge of weights was reaffirmed.

Foot note No. 1 was changed to read: "When sheets are rolled ½ gauge lighter than the gauge they represent, the next lighter gauge shall be taken for the rolling price."

No. 4 was changed to read: "All sheet iron or sheet steel shall be weighed by the company after being sheared and opened, and the company shall furnish the complete weight and number of sheets of different sizes of each turn to the roller, or put the same in a convenient place in the mill within a reasonable time after being made."

A new foot note, No. 25, was added, as follows: "Roughers running over iron to receive 10 cents per heat, 15 pair of double iron to constitute a heat."

The sheet mill hands' scale of 1905-1906 in base and foot notes was adopted.

The roughers' and catchers' scale of 1905-1906 was adopted, except that the following was made to substitute foot note No. 5: "Rougher running over iron to receive 10 cents per heat, 15 pair of double iron to constitute a heat."

Joseph H. Wallace, engineer, Temple Court Building, New York, will erect one of the largest wall paper plants in the world at a point near London, England, for the Wall Paper Manufacturers, Limited. The plant will cost in the neighborhood of $2,500,000. Contracts for the machinery have all been placed and nothing remains to be purchased but a few supplies, which will be purchased in England.

The Free Alcohol Bill Becomes a Law.

WASHINGTON, D. C., May 29, 1906.—The long pending bill providing for the use, free of tax, of denatured grain alcohol for industrial purposes, including heat, light and power, has passed the Senate, after having gone through the House, and will probably have received the President's signature by the time this issue of *The Iron Age* reaches its readers. The measure goes into force January 1, 1907, the interval being required by the Commissioner of Internal Revenue to make a study of the laws and regulations of foreign countries and to provide a code for the guidance of the bureau in the enforcement of the new law.

The bill as passed by the House was given very careful consideration at the hands of the Senate Finance Committee, which gave hearings to the representatives of the wood alcohol interests, including those manufacturers of charcoal iron who produce alcohol as a by-product. The committee became convinced that the demand for methylated grain spirits would be so great as to require the entire output of wood alcohol for denaturing purposes, and therefore that the producers of wool alcohol, at least those who, like the charcoal iron makers, produce only the crude article, would not suffer to any material extent. At the same time the committee made it perfectly clear that the benefits to be derived from a policy of free grain alcohol for industrial purposes were regarded as so great as to more than offset any possible injury that might be suffered by the wood alcohol interests.

The purpose in deferring the taking effect of the bill until January 1, 1907, was twofold; first, to enable the Internal Revenue Bureau to provide regulations for the enforcement of the law, and, second, to enable the wood alcohol interests to work up their materials on hand and adjust themselves to meet the new conditions with the least possible embarrassment. During the discussion of the bill in the Senate a strong disposition was shown to insist upon the House provision, which put the new law into force three months after its passage, but the members of the Finance Committee refused to yield this point on the ground that the Treasury officials would be seriously handicapped if compelled to make such a revolutionary change in the treatment of distilled spirits without ample time in which to prepare regulations.

While it is believed that under the regulations to be prescribed by the Commissioner of Internal Revenue no supervision will be attempted of denatured alcohol when withdrawn from bonded warehouse in moderate quantities for heat, light and power, it is probable that manufacturers using very large quantities, like those who consume it in the making of lacquers, bronzes, &c., for the finishing of hardware and other metal products, will be required to register with the Commissioner of Internal Revenue and to keep a set of books, to be supplied by the bureau, showing the quantities of alcohol received, date of purchase, &c. These requirements will be easily met by manufacturers and will enable the Government to trace any unusually large quantities that may be withdrawn from distillery warehouse, ostensibly for legitimate industrial use, but actually intended to be illicitly purified and employed for beverage purposes. W. L. C.

The Bliss Automatic Muck Bar Shear.

A muck bar shear of very compact construction, yet powerful enough to readily cut hot billets, having a cross section as large as 8 x 2 inches is shown in the accompanying illustration. The machine is entirely automatic in its action and is a product of the E. W. Bliss Company, 11 Adams street, Brooklyn, N. Y. Fig. 1 shows a view of the machine from the operating side, and Fig. 2 a rear view, which shows the drive and automatic adjustable stop for determining the length of billets cut off.

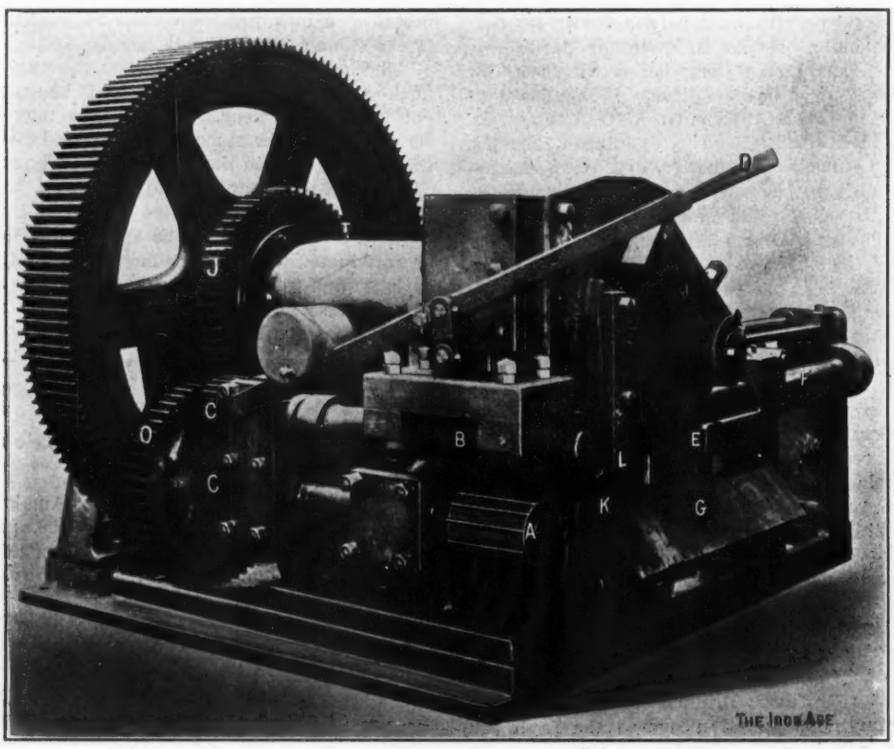


Fig. 1.—The Operating Side of the Automatic Muck Bar Shear Built by the E. W. Bliss Company, Brooklyn, N. Y.

The operation of the machine will be understood from the following, in connection with the reference letters on the engravings. As may be seen in Fig. 2, the motor pinion drives directly the large gear on the shear actuating shaft. This gear is loose upon the shaft and is clutched to it only when a stroke is to be made. A brake on the shaft with the clutch stops the shear instantly when the clutch is released. Secured to the large gear is a smaller gear, J, which, as may be seen in Fig. 1, meshes the gear O on the shaft with the lower feeding roll. The two feeding rolls are geared together by the gears C and C. A and B are the feed rolls, which are driven by gears C and C, Fig. 1. The rolls revolve continuously and are fitted with splines so as to take a good bite on the stock. The upper roll is movable vertically, and is driven from the

gear C at its left through a sleeve with square sockets fitting loosely on squared ends of the driving pinion shaft and the roll, allowing the latter a certain amount of vertical movement, without binding the drive. To cut the bar the operator simply depresses the lever D, which lowers the upper roll, causing the rolls to grip the stock and advance it against the stop gauge E, which is adjustable along the rod F, so that any desired length may be cut. As the bar strikes i this gauge recedes a little and this slight movement trips a powerful friction clutch, causing the upper shear blade to descend and make the cut. The action is repeated until the entire bar has been cut into equal lengths. The lower knife may be seen at K in Fig. 1. The upper knife is behind the upper roll. To prevent the bar from rising with the upper blade, a stripper, L, is provided. M and M are connections between the stop gauge and the clutch N, Fig. 2.

Provision is made so that the cut off portion will drop on a conveyor. This is accomplished by the rocking apron G, which is operated from the slide by the link H and the arm I, as shown in Fig 2. When the slide is up the apron is in the position shown. Just before a piece is cut the apron moves into position, so that the cut off piece can fall directly upon it. On the up stroke of the slide, the apron rocks forward again and the piece cut off slides from the apron on the conveyor. After discharging the piece it returns ready for the next one.

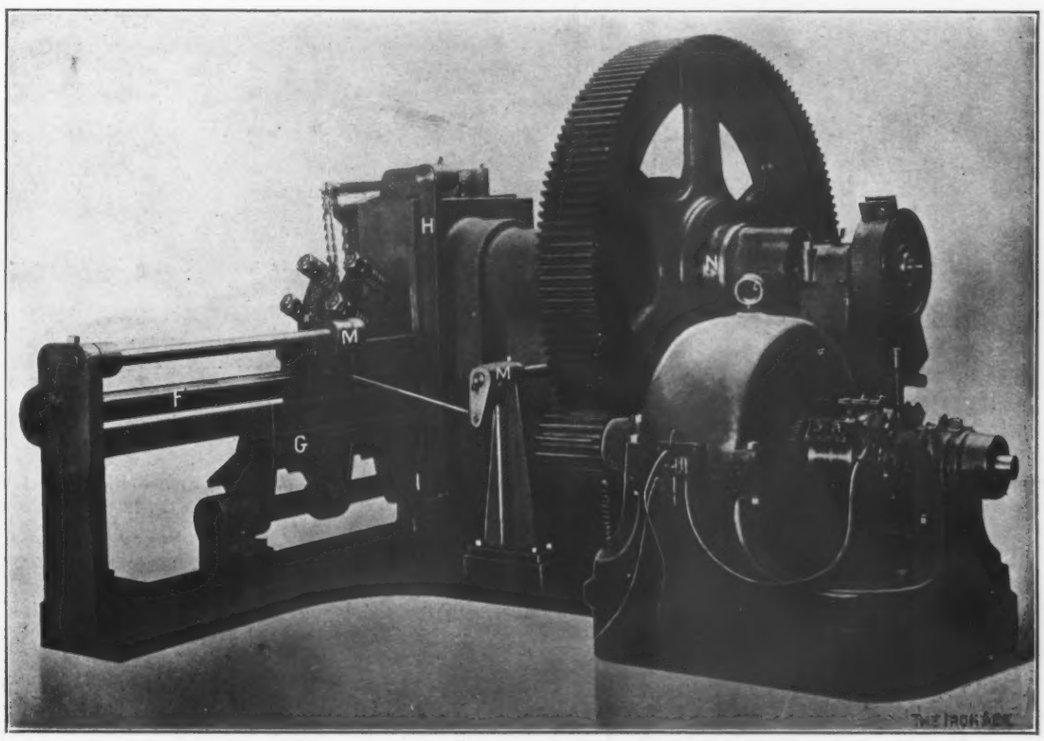


Fig. 2.—A Rear View of the Bliss Automatic Muck Bar Shear.

An idea of the power exerted by this machine may be had from the fact that it is driven by a direct connected 60-horsepower electric motor. The large balance wheel is 76 inches in diameter by 10 inches face, weighs over 8000 pounds, and runs at a speed of about 100 revolutions per minute. The total weight of the machine is about 35,000 pounds.

Recent Customs Decisions.

A Jewelry Distinction.—After several years of litigation the Treasury Department has acquiesced in the rulings of the Federal courts and has directed the classifying officials of customs to return metal belts, clasps, slides and similar articles as manufactures of metal, with duty at the rate of 45 per cent. It seems that although the articles are composed of steel or other non-precious metal, the authorities assessed duty on the goods as jewelry, at the rate of 60 per cent. Several thousand importers in all parts of the United States are affected by the Government's order.

Sad Irons.—The Board of Appraisers, in a decision by I. F. Fischer, promulgated May 24, handed down a ruling affecting the customs classification of sad irons. It appears from the testimony that José S. Mara and others of San Juan, P. R., imported merchandise of this description, which the Collector of Customs returned for duty at the rate of 45 per cent., under the provision in the tariff law for manufactures of metal. Objection was taken to this classification, as the articles were claimed by the importers to be properly dutiable at the rate of 8-10 cent per pound under the provision for sad irons. Accoruing to the lower customs tribunal no doubt exists that the merchandise should be classified as sad irons. The protest is therefore sustained.

Electrodes.—It has been decided by the Board of Appraisers that electrodes are properly dutiable under the provision in the tariff act for metals unwrought, with duty at the rate of 20 per cent. The protest calling forth this ruling was filed by Eimer & Amend, New York. This firm's importations were assessed as a chemical compound at 25 per cent. In a report filed with the board by the appraisers it is stated that the return was an error. Several other claims were made for lower duty, but they were all overruled.

Belt Pins.—On May 26 the board sustained a protest filed by the Callender, McAuslan & Troup Company, Providence, R. I., regarding the rate of duty applicable to belt pins severally about 10 inches long. The board finds that the articles are to be regarded as manufactures of metal for customs purposes, and are not to be considered jewelry, as returned by the appraiser.

Metal Fob Chains.—In a decision by General Appraiser Sharretts, the Board of Appraisers on May 26 decided that metal fob chains must pay duty at the rate of 60 per cent., as jewelry. It was maintained by the importers, Albert Lorsch & Co., New York, that the goods came within the definition of manufactures of metal as used in the tariff law. The protest was overruled.

The Columbus Impeller Pump.

BY E. K. HOOD.

Some interesting results have lately been obtained from the Columbus impeller pump manufactured by the Roth Company, Columbus, Ind.

The principle of this pump is one of the oldest and simplest used for the elevation of water, but this company seems to be the first to have applied it with commercial success. Primarily, this pump consists of a head either electrically or mechanically driven, suspended from which, and extending into the well to any desired depth, is a shaft carrying impeller and a cage carrying retarder. In the engravings, Fig. 1 shows a cross section of a mechanically driven head, and Fig. 2, one section of shafting.

The head consists of a discharge tee, yoke frame and bearing saddle. Most of the load on the drive shaft is a vertical downward one and it is supported by a roller bearing in an oil tight cup on the bearing saddle. The side thrust on the shaft, where it is belt driven, is taken by long sleeve bearings. Glands are

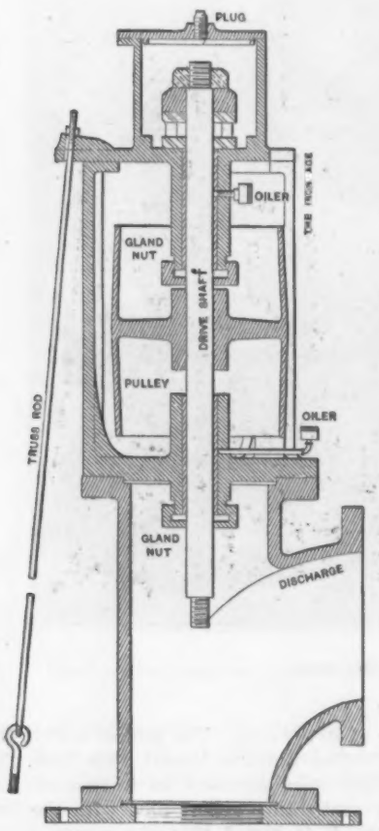


Fig. 1.—Vertical Section of the Head of a Columbus Impeller Pump and a Section of Impeller Shafting—

Fig. 2.

provided on the end of each of these bearings to keep the oil from working down on the shaft. The head is mounted at the top of the well so as to bring the shaft concentric with the casing. Any desired number of impeller shaft sections, such as is shown in Fig. 2, are coupled to the drive shaft, and the corresponding cages are coupled together, with the upper cage securely fastened to the discharge tee.

The construction of the impellers is peculiar, each consisting of one turn on a 3-inch pitch spiral, cast integral with an annulus surrounding it. The diameter of the impeller is 1-16 inch less than an enclosing steel annulus which is riveted to the three-bar cage. A narrow packing strip of either leather or rubber is riveted to the steel annulus, so that the whole cage fits the well casing snugly and prevents back leakage. Immediately below each impeller a retarder, helical in form, is riveted to each supporting bar of the cage. The sections of shafting are 10 feet long, and any required number can be coupled together.

In making an installation the lower two impellers are submerged. The shaft is then rotated at high velocity, and the discharge of water depends upon the size of the pump and speed.

The principle of operation is very simple. The lower impeller imparts a spiral upward motion to the water. The retarders arrest the spiral motion, but the water is continued in its vertical path. The next impeller catches it and imparts a second spiral upward motion, which is in turn retarded, and the operation is repeated until the water is discharged at the head of the well.

An initial test of a 6-inch pump where the discharge was capped showed that it was possible to have a discharge pressure of 18 pounds when the shaft was rotating at 1200 revolutions per minute. A few notable tests show the efficiency of this pump. A pump made to fit a 9⅝-inch well casing was installed in the city of Tacoma for use in its water plant. The water stood at 80 feet in the well, and 100 feet of shaft was operated on the pump. An air lift had failed to bring up any water, probably because the well was not deep enough. The pump was started at 1200 revolutions per minute and brought 1780 gallons of water per minute. A 75 horse-power motor was used, which showed that it had a very easy load indeed.

Another interesting report came from the rice fields of Arkansas. An 8¼-inch pump with 50 feet of shafting was installed in a well wherein the water stood 38 feet from the surface. The pump was started, and at 110 revolutions per minute brought very little water. It was then determined that the strainer was clogged, and 10 feet more of shaft was added. The speed was increased to 1500 revolutions per minute, and in 20 minutes the pump had discharged ten wagon loads of quicksand, besides a copious supply of water. The speed was then reduced to 1100 revolutions, and the pump delivered 750 gallons per minute continuously. It was feared that the sand had cut the pump, but upon investigation there was no appreciable wear. This is explained by the fact that the shaft tends to seek a center, as it is accurately balanced, and there are no bearings in the path of discharge.

These pumps can be installed to any depth up to 200 feet without digging a pit, and for this reason there seems to be a very large field for them in irrigation work. They also seem to be especially adapted for handling muddy water and thick, heavy materials, as there are no valves to cut out.

Electrolytic Corrosion of Structural Steel.—At the Ithaca meeting of the American Electrochemical Society, Maximilian Toch read a paper on the problem of protecting the steel structures of buildings, &c., against the electrolytic effects of stray currents. While such destruction goes on, the author emphasized that it is not nearly as bad as some people think. He had made extended tests in which two pieces of steel of known high grade quality were immersed in wet earth and a small current from an outside source sent from one plate to the other for a long period. In every case the anode plate rusts very rapidly, while the cathode plate remains in good condition and free from corrosion. The first oxide which appears on the anode is the green oxide. When a third plate, not connected to the circuit, was inserted in the earth between the other two plates, it showed corrosion almost midway between that of the two others. Electrolytic rust is a totally different oxide of iron than chemical rust. Steel cannot be protected against corrosion by simply embedding it in concrete, but the proper way is first to cover it with an insulating paint and then place it in concrete. This method has already found application in the power house of the Pennsylvania Railroad in Long Island City and in other places.

The Cooper Hewitt Mercury Vapor Lamp for Industrial Lighting.

The Cooper Hewitt mercury vapor lamp, invented by Peter Cooper Hewitt of New York as the outcome of a long study of electrical vacuum phenomena, has come into wide commercial prominence in the past year in many interesting and important installations in the field of industrial lighting. Recent improvements in design and construction have increased its general utility, and the perfection of a new type of lamp adapted to practically all alternating current lighting circuits has doubled the field of its possible usefulness.

Latest Form Described.

The complete Cooper Hewitt lamp outfit, in its latest form, consists of the glass vacuum tube, the holder and reflector and the auxiliary. The tubes of direct current lamps have a positive electrode of iron at one end and a negative electrode of metallic mercury in a bulb at the other end. The tubes of the new alternating current lamps have two positive electrodes of iron at one end and a negative electrode of mercury at the other end, the alternating current entering the vacuum by the positive electrodes and leaving by the negative electrode. The alternating current lamps thus really operate as a converter, in application of the principle of negative electrode resistance discovered in the first invention of the mercury lamp. They are started as the direct current lamps are started, by a temporary tilting to permit the flow of mercury from one end to the other in a small stream, which momentarily bridges the vacuum, the resulting arcing of the current vaporizing some of the mercury and the subsequent steady current flow increasing the vapor pressure and exciting it to a high degree of incandescence. Many type H lamps are now made with a small solenoid or magnet on the suspension bar just above the holder, for accomplishing this tilting automatically when the circuit is closed. These automatic lamps are used in installations in which it would be inconvenient to reach the tilting chain with the hand or a hook.

The auxiliary, consisting of two or three coils of resistance wire, an inductance coil, and usually a ballast bulb to correct abnormal voltage variations, all connected in series with the tube, is inclosed in the new lamps under a 12-inch metal canopy and fastened securely to the ceiling above the lamp on a plate attachment having a crow foot into which the lamp suspension bar is screwed, thus becoming a part of the lamp fixture. The special auxiliaries for series lamps have in addition an automatic cut off and shunt resistance. The new ballast bulb, an interesting feature of the auxiliary, provides economical protection against undue voltage rises by means of a fine iron wire mounted in a small glass tube somewhat resembling a miniature incandescent globe, with an inert atmosphere to prevent oxidation of the wire. This iron wire possesses to a peculiar degree the property of increasing its resistance very rapidly as its temperature is increased, so that a lamp protected by such a ballast becomes operative through a considerable range of voltage without the loss in efficiency which would be unavoidable in the case of a voltage control by resistance possessing no such graded temperature correction.

Special Features of the Lamp.

When the Cooper Hewitt Electric Company, 220 West Twenty-ninth street, New York, first put the mercury vapor lamp on the market its interesting scientific features and the attention everywhere attracted by the novelty of its bright light overshadowed for a time commercial recognition of its industrial value, but it is today being installed in large numbers in factories and work rooms of all sorts, in several standard styles, designed to meet any requirement of commercial lighting systems.

The records of the performance to date of mercury lamps installed in 1904 and 1905 have demonstrated that the operating life of Cooper Hewitt tubes exceeds 5000 hours in numerous instances. The New York Transportation Company recently renewed four tubes which had been operated over 10,000 hours each, and three of them were in fair operating condition when returned to the factory, but somewhat blackened from long service. As the only cost of maintenance in mercury lighting is for tube renewals (about one-third the original cost of the complete lamp), the demonstrated long life of the tube gives a new importance to the figures of its high efficiency. Tubes continue to operate perfectly until the vacuum becomes impaired, with no consumption of the light giving element.

All other methods of artificial lighting require the heating to incandescence of some solid substance, usually carbon, with the loss of much the greater part of the energy consumed in the generation of heat and the more or less rapid consumption of the lighting substance. In the Cooper Hewitt lamp a long glass vacuum tube, 1 inch in diameter and from 17½ to 45 inches long in the standard types, is used, in which mercury vapor is excited to a high degree of incandescence by the passage of the electric current, with a generation of heat that is reduced to a minimum. The radiant heat from mercury lamps, therefore, is in proportion to lighting capacity a very small part of that given off by incandescent globes or arc lamps, and this high efficiency, which means an all important saving in current consumption, has incidentally meant also a material reduction in the temperature of work rooms in many installations in which the heat from former lighting methods had been very noticeable in hot summer weather. The operating economy is also well established.

In the growth of Cooper Hewitt lighting, considerable attention is being attracted to the peculiar merits of its illumination—the even diffusion of light from a luminous surface of great extent, which prevents the formation of sharply defined lights and shadows or the contraction of the pupil of the eye caused by the concentrated luminous points of other lights, and the freedom of the mercury spectrum from red rays, attributed physiologically as the chief cause of eye fatigue in work under other artificial illuminants. Light is emitted in even intensity from every portion of the tubes, and there are no dazzling or bright moving spots. The mercury light, its advocates assert, is the only one in which the spectrum is deficient only in the rays undesirable in a light to work by.

Adoption for Industrial Use.

The Cooper Hewitt lamp has been extensively adopted during the past two years in large machine shops and foundries, where the saving effected in current consumption has been very great; in business offices, in which the superior working quality of its light has dictated its use, apart from the consideration of its economy; in the press and composing rooms of many of the largest publishing houses in America, where the disadvantages of wiring around machinery are avoided by its use; in railroad repair shops; in drafting rooms; in pier sheds and freight houses; in textile mills, where the searching character of its light is of special value; in automobile garages and shops; in piano and organ factories, leather and paper mills, glass and rubber factories, copper and sugar refineries, hat factories, navy yards, wood working plants and in many other industries in which its illuminating value and economy have peculiarly recommended it.

Among prominent recent installations are those at the enlarged Newark works of the Westinghouse Electric & Mfg. Company, where 470 lamps are in use; at the new model factory of the J. L. Mott Iron Works at Trenton, equipped with 113 lamps; at the new Baring Cross shops of the St. Louis, Iron Mountain & Southern Railroad at Argenta, Ark., equipped with 105 lamps, and at the new Attica works of the Westinghouse Machine Company, where 86 lamps are used. Five of the largest river piers in New York are lighted by them. All the United States Government currency and internal revenue stamps are printed under their light in the Bureau of Engraving and Printing at Washington, and the Automobile Club of America will use 96 lamps in its new garage building in New York.

The Northern Electrical Mfg. Company's present San Francisco address is rooms 403-5, Atlas Building, 604 Mission street.

A New Waterbury Double Horizontal Bull Block.

The double horizontal bull block shown in the illustrations is a powerful machine, designed to take ¾-inch wire rods and reduce them. The machine, a general view of which is given in Fig. 1, is built by the Waterbury Machine Company, Waterbury, Conn. It takes 18 or 20 inch blocks, frequently one of each size being employed, and is back geared 19 to 1, or may be built with a gear ratio 16 to 1. Double helical, or herringbone, teeth are used in the first drive and straight teeth in the drive to the block shaft. The blocks make 20 revolutions per minute, the wire running from 100 to 125 feet per minute. The blocks are started and stopped while the machine is running, by means of a double pin clutch operated by a rod at the end of the block shaft.

Referring to Fig. 2, it will be seen that the universal die holder has both horizontal and vertical swing, in order that there may be a straight pull through the die, which follows the movement due to the pull of the wire as it winds around the block. No part of the double wedge grappling tongs, which hold the end of the rod, is above the surface of the block, as they retire into a recess, as shown in the drawing. In Fig. 2 details of the die holder A and block are given, the tongs B being shown in two positions—when starting and after retiring into the recess while drawing. The die is at C. The universal die holder is balanced in its vertical movement by a spring.

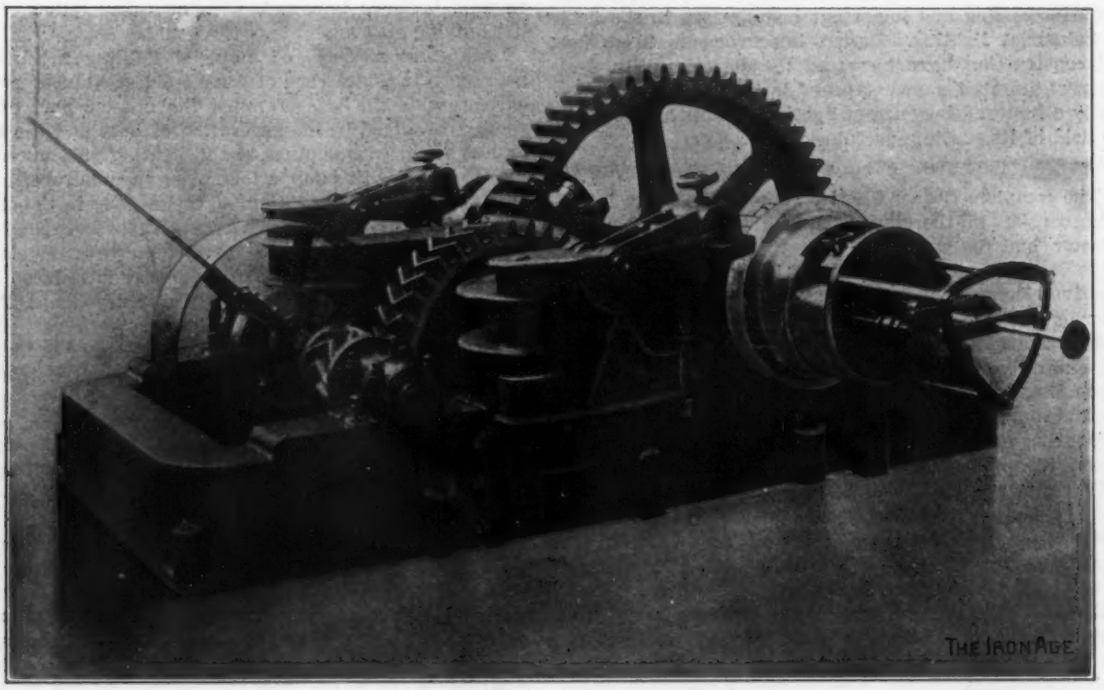


Fig. 1.—The New Double Horizontal Bull Block Built by the Waterbury Machine Company, Waterbury, Conn.

Details of the clutch and block mechanisms and construction are shown in Fig. 3. The front plate on the block, carrying the spider reel, is seen at D, the front plate of the hub, which holds the block on the shaft at E, and the clutch hub, keyed to the shaft, at F. The block is loose on the shaft and is balanced, so that it will always stop with the tongs on top. At G are the two clutch pins in the block, operated by the rod H. The clutch pins engage the tool steel shoes J in the clutch hub. To get at the clutch mechanism all that is necessary is to remove the plate E, which is held by three bolts. The block then may be removed, complete with the spider reel. A friction clutch is employed in transmitting power from the driving pulley as a precau-

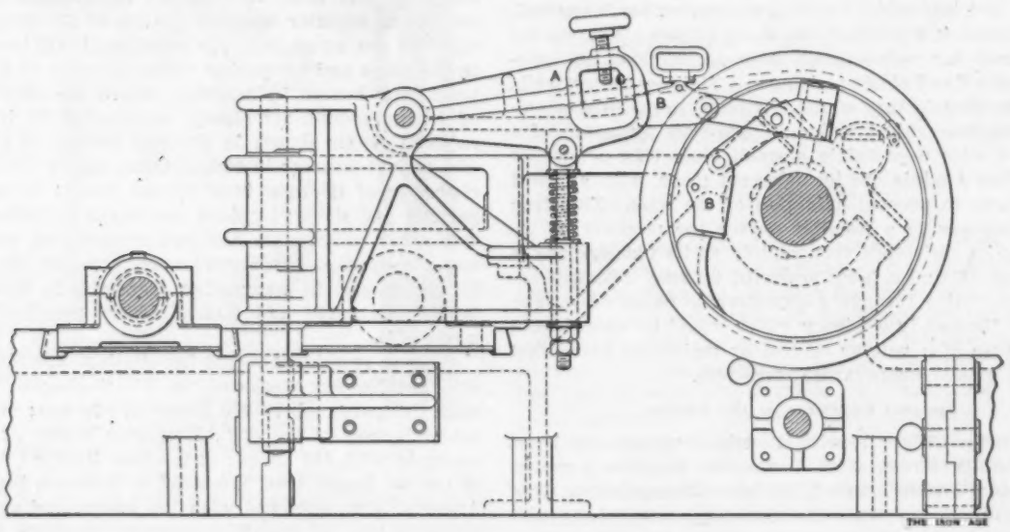


Fig. 2.—Detail Side Elevation, Showing the Universal Die Holder.

tion in case of emergency. Much care is taken in the construction of the machine; all of the bearings are of phosphor bronze, and the gears are machine molded.

Active Exploration for Lake Ore.

Canadian and Baraboo Operations by the Steel Corporation.

DULUTH, MINN., May 26, 1906—The Oliver Iron Mining Company is doing a large amount of new exploration this spring in out of the way localities. The company has several crews of explorers all under the supervision of R. H. Flaherty, west of Sabawe Lake, on the Canadian side of the international boundary and north of Minnesota, a few miles from the operations of the Atikokan Iron Company. This district is in the magnetite formation, and some distance from the soft hematite locations explored by Mr. Flaherty a year or two ago. They lie 130 miles west of Lake Superior. In the same locality the Atikokan Iron Company is opening its mine to furnish ore for its new 100-ton furnace at Port Arthur, and it is understood that Pickands, Mather

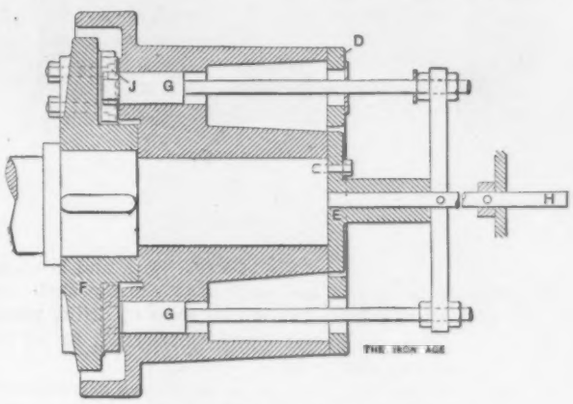


Fig. 3.—Details of the Clutch and Block.

& Co. and other American concerns will be at work in the same field before long. Pickands, Mather & Co. and the Lackawanna Steel Company are very closely associated in the matter of ore supplies.

Under charge of W. J. Trebilcock, late of its Mansfield mine, the Oliver Company is reported to be doing considerable new work in the Baraboo district, in south central Wisconsin. Reports by experts employed by the company have generally been understood to be unfavorable to the expenditure of much money there. But there is no question that the company is now working there and that it will explore, both by drills and shaft sinking. The Pittsburgh Steel Company, which has been working at Baraboo with quite an extensive force for several years, has finally ceased all operations and abandoned its options. The district, as a whole, is very quiet, and the advent of the Oliver Company adds to local confidence, which was considerably shaken.

The Oliver Iron Mining Company is also sinking exploratory shafts in the Cuyuna district, where it has secured options on very large tracts of land. Shafts for exploratory purposes have been started and drill work is to be undertaken. While it is conceded that this ore is very lean, the Oliver Company looks a long way ahead, and there will probably come a time when such ores as have been found there in considerable quantity will be worth mining.

Energetic New Work on the Old Ranges.

Exploration in the recognized Lake Superior districts, by the Oliver and other companies, is quite active. There is not so much now on the Mesaba, and more on the Menominee and parts of the Marquette and Gogebic ranges. Much work that was in progress a while ago on the Vermilion has ceased. Around Palmer, southwest of Marquette, some excellent ore is being found and exploration will begin there very soon. There is a good deal of drilling in the Cascade district of the Marquette range, and the new work of the Cleveland Cliffs Iron Company, on Pittsburgh & Lake Superior lands, will have a very important effect upon the situation in all that region. The Oliver Company is preparing to begin exploration near Swanzey, and will work first near the Princeton mine, on lands owned by the Chicago & Northwestern Railroad. The Cleveland Cliffs Company now has two mines in the Swanzey district, which it is working with many men. This company is also drilling on the shores of Lake Bancroft, at Ishpeming. The drill is only about 600 feet from the company's Cliffs shaft dryhouse. Several hundred yards to the west the same company has a drill at work near Carp River. It is known that ore extends under the lake from the east, and it is hoped to catch it on the other side, in which case an important ore body will have been discovered.

In the Iron River district options have been taken on many tracts and many drills will be employed. Indeed, the older districts of the lake are all having a boom. It is no more noticeable in Iron River than in Crystal Falls, or Negaunee, Ishpeming and surrounding villages that have been dead to the world for many years; it is also much in evidence at outlying parts of the Gogebic range, as elsewhere. Wherever old workings at any time showed indications of ore these are now being pumped out, reopened and explored. Many old time scrams are now getting into shape for mining on a considerable scale, and on a better basis than ever before, and some of them have already turned out excellent mines. This has been particularly the case in the Crystal Falls district.

At Crystal Falls the old Hollister mine is to be reopened by M. A. Hanna & Co. The old shaft is being unwatered and will be retimbered to its depth of 150 feet, when it will be sunk to about 600 feet and exploration undertaken from that depth. The mine was opened in 1889 and shipped a slight tonnage for a year or two. It was reopened in 1892 and again in 1898, but failed to become valuable enough to stay. The ore is good and diamond drill holes have shown it to have considerable extent.

It really looks as though the Shagawa Iron Company had found a mine on Section 30-63-11, Vermilion range, where it has been at work since last October. The shaft is now down 290 feet, and is again in ore of high grade. Three shifts are employed and the work is progressing rapidly.

The Cleveland Cliffs Iron Company has some small ore deposits near Snowball Lake in T 56-23, between Nashwauk and Bovey, Minn., and is to open one of them this year. These will be served, doubtless, by the Great Northern road. Other deposits in the same general vicinity may be opened this year.

The Hill Ore Deal Definitely Off.

It is generally understood now that the deals for the sale of Great Northern ore lands on the Mesaba range to the United States Steel Corporation are definitely off and that if any later negotiations are entered they will have to be from the beginning. H. V. Winchell, who has become geologist for the Great Northern road, will give much of his time and attention to the exploration and development of the Mesaba range lands of the company. It has on the western Mesaba, especially in 57-21 and 56-23, large tracts that have been very imperfectly prospected, and only by occasional holes, because the company has made no attempt to explore them thoroughly. It will be part of Mr. Winchell's duties to develop these and other lands of the company to prove up a tonnage that can be measured, and that will, it is confidently hoped, justify the faith of the Great Northern Company. Mr. Hill has always banked very much on these undeveloped lands when speaking of the tonnage his road controlled. Holes scattered for some miles, and at long intervals, have found ore, but it is not known if these are small isolated deposits or large mines. Mr. Winchell's work during the next few years will determine all this. D. E. W.

The Brooks plant of the American Locomotive Works, Dunkirk, last week delivered to the Northern Pacific 50 new locomotives, on its order of 135. Of the number completed 20 were passenger locomotives, equipped with an automatic device for opening and closing the fire box door, serving to lessen the fireman's labor.

Lyon's Factory Furniture.

In the equipment of modern factories and warehouses there is a growing tendency to adopt facilities for systematic and safe stock keeping. "A place for everything and everything in its place" is imperative if economy in

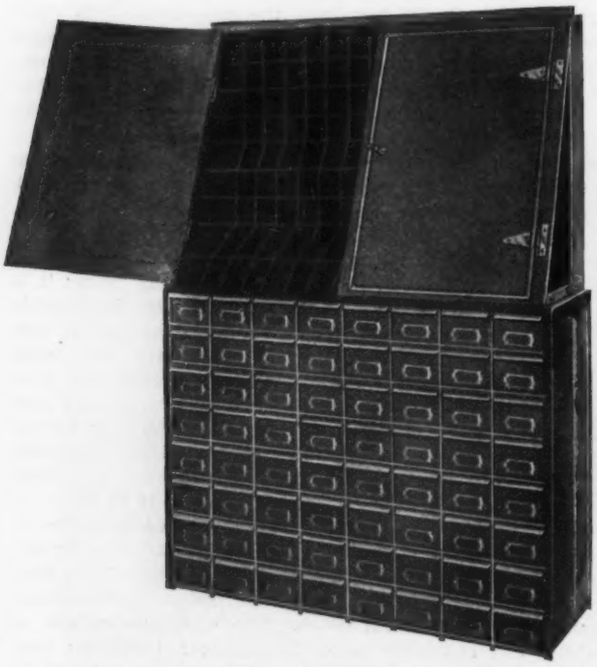


Fig. 1.—Sheet Steel Cupboard Built by the Lyon Metallic Mfg. Company, Chicago.

operation and saving of time, effort, space and repair charges are to be obtained. A solution of this important problem is the installation of suitable and safe factory furniture, such as racks, cabinets and bins. The Lyon Metallic Mfg. Company, Chicago, has designed a system of solid steel factory equipment, examples of which are shown herewith, and for which are claimed compactness, ease of portability and, by virtue of the character and method of construction, serviceableness for a long period of time, with greater carrying power than is possible in wooden equipment.

Fig. 1 of the illustrations is a sheet steel cupboard, especially designed as a file or screw cabinet. The upper part has 126 openings, 3 inches wide by 3 inches high by 13 inches deep at the bottom and tapering to 5 inches deep at the top. The lower section contains 64 steel drawers 6 inches long by 6 inches wide by 4 inches deep. The drawers are made of No. 22 gauge steel and are fitted with handles and label holders. A special back in the lower section contains three open shelves 48 inches long by 9 inches deep by 12 inches high. The case occupies floor space 50 inches by 16 inches and is 60 inches high. The double steel doors are provided with a lock and the articles may thus be kept under key.

A toolroom rack is shown in Fig. 2. It is made in

Fig. 2.—An All Metal Tool Rack.

several different sizes, from 3 to 8 feet long, and is about 48 inches high. All of the sections of the top shelf are fitted with name plates, so that all sizes of drills, reamers, &c., can be carried and can be picked out by an inexperienced stock clerk without delay.

The illustration in Fig. 3 is taken from a manufacturing plant and shows one corner of the stockroom for dies, &c. A rack similar to this one is made for the same purpose, but in addition is equipped with steel pulls, which act as card holders and are also used to pull the dies out. These pulls are of No. 16 gauge steel, with a turndown in front, which is used as a card holder. The pulls are numbered and each number is recorded in the die stock book.

Fig. 3.—Metallic Shelving for a Die Stock Room.

The fourth illustration is a view of a stockroom in the Cutler-Hammer Mfg. Company's plant at Milwaukee, and gives an idea of the arrangement of the equipment

in that concern's factory. As mentioned above, the racks are portable. They are built in sections, can be readily taken apart, easily removed and put together again. The steel racks, too, naturally involve lower insurance cost, as the possibility of fire and accident is reduced to a minimum.

The Boiler Makers' Convention.—In Pittsburgh last week a meeting was held of the local committee having charge of the arrangements to entertain members of the American Boiler Manufacturers' Association at its meeting, to be held in that city in September, and plans for entertainment of the visiting members were made. A banquet will be served, and Congressmen John Dalzell and James F. Burke have been secured as speakers. The members will be given a daylight ride up the Monongahela River and will return after dark to allow the visitors to see the mills on both sides of the river lighted up. This local committee is composed of George N. Riley, chairman; Thomas Rees, James Lappan, Robert Monroe, Jr., all of Pittsburgh; J. D. Farasey, secretary, D. J. Champion of Cleveland, and W. O. Duntley of Chicago. Other meetings of this committee will be held before the convention meets in order to perfect its plans for entertainment of the members.

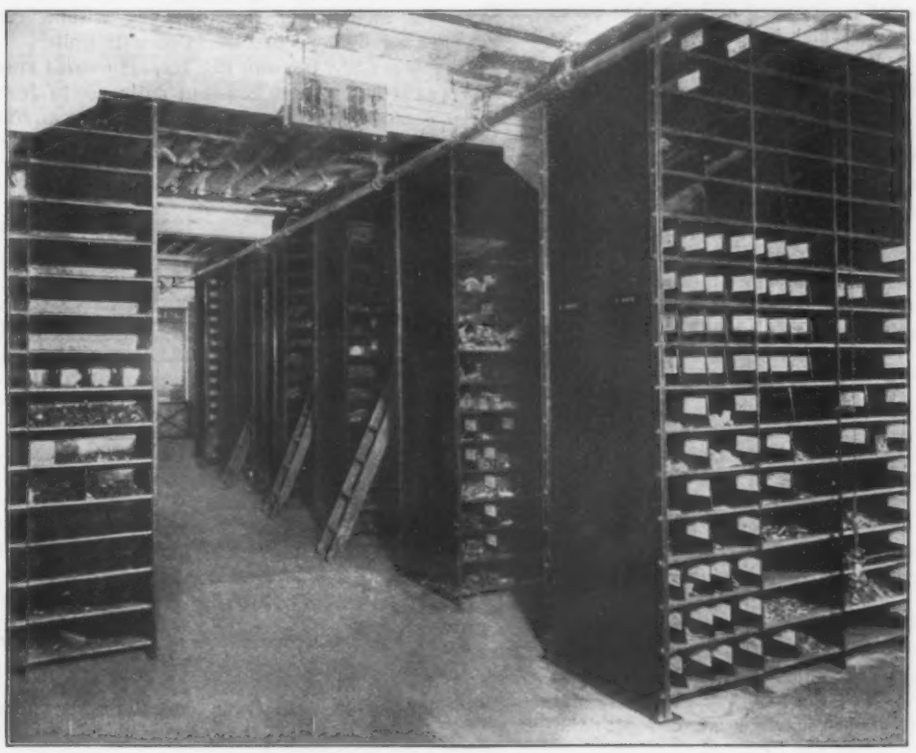


Fig. 4.—A View of the Lyon Equipment in the Stock Room of the Cutler-Hammer Mfg. Company.

The Shelby Steel Tube Company.—This company, with main offices in the Frick Building, Pittsburgh, has decided to erect a new plant at Ellwood City, Pa., for the manufacture of seamless tubes. The plant will cost approximately $1,250,000, and will probably give employment to between 1200 and 1500 men when completed. A large lot of iron working tools and other equipment will be needed for the new plant. The company has operated for some years a plant at Ellwood City making seamless tubes, but the new works will be much larger than the present plant. It is an identified interest of the National Tube Company.

The Cambria Steel Company, Johnstown, Pa., has changed its No. 2 rail mill, on which medium section rails were rolled, into a structural mill. It will roll 3 x 3 up to 6 x 3½ inch angles, beams up to 7 inches and channels up to 9 inches. The mill will be ready to roll these sections early in June.

Rolling Mill Wage Scale Conferences.

Arrangements have been made for a conference between the Western Bar Iron Association and the Amalgamated Association, to be held in Detroit, Mich, commencing May 31. The Western Bar Iron Association was recently organized, and is composed of leading independent bar iron mills in Ohio, Indiana and Illinois. It will be represented by S. C. Leonard, president, and James H. Nutt, secretary.

Early in June a conference will be held between the American Sheet & Tin Plate Company and the Amalgamated Association, for the purpose of arranging wage scales for those sheet and tin mills of the company operating under the Amalgamated scale. The number of such mills is relatively small, the company's most important sheet and tin plate mills being operated non-union. After the conference with that company has been held a conference between the Amalgamated Association and the independent sheet and tin plate mills will be held, probably about June 20. The changes in the sheet and tin plate mills asked for by the Amalgamated Association in the new scales are unimportant, and for this reason it is believed that a quick settlement will be effected. The Amalgamated Association has re-elected the following officers for the year commencing October 1: P. J. McArdle, president; John Williams, secretary and treasurer, and M. F. Tighe, assistant secretary.

Labor Notes.

The New York Court of Appeals gave a decision on May 25 upholding the contention of Harry Marcus, a New York skirt manufacturer, that the section of the Penal Code which forbids an employer to enter into an agreement with an employee binding the latter not to join a labor organization is unconstitutional.

At Lynn, Mass., the places of the striking machinists are being filled through the National Metal Trades Association.

Meetings for the organization of local associations as branches of the National Metal Trades Association are to be held in the next two weeks in Baltimore, Troy, N. Y.; Providence, R. I.; Bridgeport, Conn., and Springfield, Mass.

Compression of Steel Ingots in the Mold.*

BY A. J. CAPRON, SHEFFIELD, ENGLAND.

The subject of the fluid compression of steel has recently assumed such prominence that but little introduction is necessary. Its use up to the present has been chiefly confined to the higher qualities of steel and the largest sizes of ingots, but the system to be described is relatively very cheap, both in first cost and in working, and moreover a single press can deal equally well with a few ingots of moderate size or with a large number of smaller ingots, making the process applicable on a much more commercial and wider scale.

The Process Described.

The process consists in utilizing special forms of ingot molds, so constructed that pressure can be applied to the ingots in a horizontal press. The ingot molds are preferably placed in series, so as to reduce the power of the press required. It should be mentioned that both the various forms of molds used and also the press are the subjects of patents which have been taken out by Messrs. Robinson and Rodger of Sheffield, and constitute improvements on the American and English patents of John Illingworth of New York. On this system a horizontal press was used, and means were provided for opening the molds after the casting of the ingots. These ingots were of small size, say about 80 pounds, and the method of pressing was to insert a plate or wedge between the opened mold and the still hot ingot. Upon the pressure being applied the mold was closed and the ingot compressed to the extent of the thickness of the inserted plate. This mode of procedure was found to be inapplicable to ingots of any considerable weight, and the methods about to be described were devised and used up to the present with unvarying success. Mr. Illingworth is interested with Messrs. Robinson and Rodger in these new developments.

The ingot molds are placed inside the press, the steel being run into the molds in this position, so that they do not have to be transported with the liquid steel in them, and the press practically forms the casting pit. The ingot molds are open at the bottom, and may each have a separate loose bottom plate, or may stand upon one common plate for bottom running. The ingot molds shown in the illustration, which represents an 8000-ton press, are divided in the center, there being a loose packing piece of any convenient form and size on each side between the halves of the mold, or the entire sides of the molds may be made removable according to the purpose for which the ingots are intended.

The steel is cast into all the molds simultaneously, either by means of a trough with a separate runner for each mold, or in groups by means of bottom running. Within a few minutes of the casting the ingots solidify on their surfaces, and shrink away from the molds, so that the packing pieces can be withdrawn with perfect safety, and the pressing can be commenced, just sufficient pressure being applied to follow up the contraction that is taking place. The pressure is continued, and gradually increased during solidification, until a final pressure of about two tons per square inch on the surface is reached, and this pressure is maintained for a short time, insuring absolute solidity in the ingot throughout.

Another construction of ingot mold is used in a 5000-ton press. The sides are then held in place by grooves in the cross plates, which are made deep enough to allow for the requisite compression. The press holds the molds in place during casting, and there being no packing pieces to remove, it can at once follow up the contraction until the maximum pressure is reached.

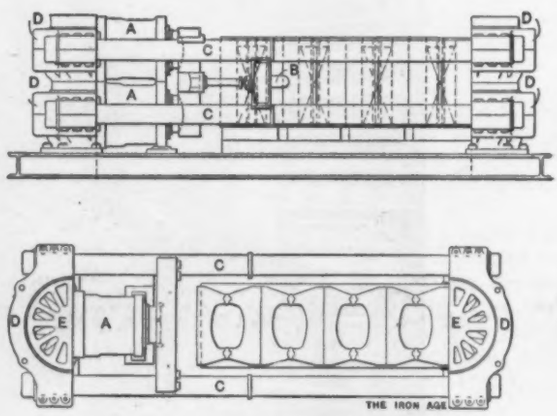
Construction of the Press.

The various parts of the press illustrated are as follows: A, pressing cylinders; B, pushback cylinders; C, tension bars; D, steel straps (in tension); E, cast iron packing blocks (in compression). The length of the ingot molds being generally greater than their width, it is convenient to have two pressing cylinders, as shown, one above the other, so as to distribute the pressure better on the molds. This halves the size of the pressing cylinders and reduces the weight of the parts. The cylinders abut on the semicircular packing blocks and the strain is transmitted to the columns through the steel traps. These straps may be made in halves, as shown, in which case no nuts are required on the columns, but only plain solid collars. This construction of press has also been patented, the advantages being simplicity and cheapness compared with the usual design of press. It is also an extremely convenient form of press for erection, and the weight of the various component parts is extremely moderate, even for presses of very great power. The rams are made hollow and fitted with spherical-ended thrust rods, so as to avoid all uneven strains that might otherwise be caused by any unequal yielding of the ingots.

The press is worked by direct high pressure pumps at about 3 tons per square inch. The gradual increase of pressure required is regulated by a by-pass valve, the regulation being an extremely easy matter, and the power required being very small, 30 horse-power being sufficient for an 8000-ton press dealing with a cast of 60 tons of steel. This process is already quite

Beyond the Experimental Stage,

as it has been in constant daily use in Jessops' works in Sheffield for over two years in the manufacture of their highest qualities of crucible steel. The press they use



An 8000-Ton Hydraulic Press for the Fluid Compression of Steel. —Elevation and Plan.

is of 1100 tons power, and the sizes of ingots made at a cast and the time occupied in compressing are as follows:

	Minutes.
One ingot of 34 cwt.	45
Two ingots of 17 cwt., placed tandem	35
Six ingots of 8½ cwt., ranged two abreast	25

Up to the present upwards of 1500 ingots have been dealt with in this press, and not a single failure has been experienced.

It is the practice at Jessops' works in the case of the larger sizes of ingots to keep the top open during the process of compression. This is done by laying a fire clay ring on the top of the ingot and using a feed rod. Directly the compression commences, just sufficient pressure is applied to cause the liquid metal to rise up into this ring. The level of the liquid metal is watched by the man who controls the pressure, and it indicates exactly the increase of pressure required to take up the contraction due to cooling. Toward the end of the process the last portion of the liquated metal is squeezed out and rejected. Analysis shows that this contains about 0.05 per cent. of sulphur, or about four times the average percentage in the ingot, and consequently a substantial improvement in quality is effected by this means, which is very valuable, especially in high class steels. An ordinary pressure gauge indicates when the full pressure has been reached.

The Results Accomplished.

The following analyses of drillings, taken from a compressed ingot, the holes being drilled at different points,

* Read at the May meeting of the Iron and Steel Institute, London.

beginning close to the top and running close to the bottom, show a remarkable uniformity of composition and absence of segregation:

Holes.	Sulphur. Per cent.	Phosphorus. Per cent.
No. 1	0.011	0.009
No. 2	0.019	0.013
No. 3	0.019	0.009
No. 4	0.016	0.011
No. 5	0.016	0.009
No. 6	0.014	0.009
Liquated portion squeezed out	0.052	0.027

Other analyses show equal uniformity of composition, and this was the invariable experience.

The best proof of the success of this process is the fact that the waste amounts to barely 5 per cent., that is to say, practically the whole of the ingots are used, and stand without any instances of failure the very severe tests of finishing and hardening to which crucible steel is subjected in making milling cutters and other similar tools.

With open hearth steel equally satisfactory results have been obtained, and Messrs. Jessop are now putting down a 7200-ton press for this class of steel, and for dealing with larger ingots up to 20 tons in weight.

To summarize, the advantages obtained by the use of this system are briefly as follows:

1. An absolutely sound ingot is insured free from any pipe or cavity, so that the whole of the ingot can be used, and practically no waste incurred.

2. Being able to watch the top of the ingot and get rid of the liquated portions, a great improvement in the quality of steel can be obtained.

3. The ingots are cast in place, and have not to be moved until the completion of the compression.

4. The simplicity and cheapness of the plant, and the ease with which it can be worked by unskilled labor.

5. Owing to the way the molds are divided, the ingots are made parallel, which is some facility in rolling.

The process is, of course, specially suitable for cases in which a superior quality of steel and severe tests are required, as, for instance, for tires, axles, billets for wire drawing, and all other purposes in which the absolute soundness of the steel and freedom from blow holes and all defects are of great importance. Besides this, advantage may be taken of the fact that the compressed ingot is at least equal to steel that has been forged or bloomed, and consequently the cost of the subsequent processes of manufacture may in many cases be greatly reduced by the adoption of this system.

Buffalo Compressed Air Forges.

The use of compressed air for producing the blast in portable riveting forges has recently been developed by the Buffalo Forge Company, Buffalo, N. Y. One such application is shown in Fig. 1. In this design the air is admitted by a needle valve through two brass nozzles into a cast iron mixer nozzle and thence direct into the tuyere. The action resembles that of a steam injector, free air being drawn in to augment the volume. By the use of this needle valve the volume of air furnished is varied without affecting the pressure, and by the compounding of the injector action the volume of compressed air required is reduced one-half. Another application, in which the compressed air acts directly upon the blast fan of the forge, is shown in Fig. 2.

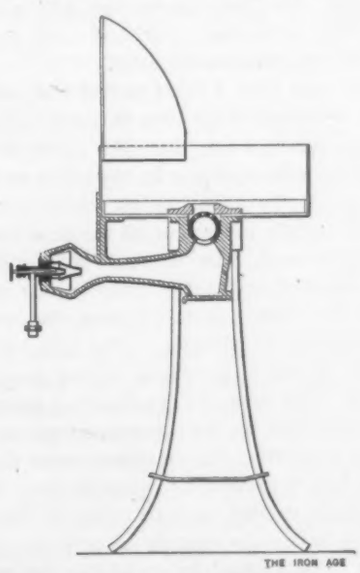


Fig. 1.—The Buffalo Compressed Air Injector Type Forge.

Extensive experiments show great economy in using the jet of air direct into the tuyere, as described above. For example, it is stated that it takes one-ninth the amount of air to operate a forge in this manner that it does to operate the fan forge with compressed air, as in Fig. 2, and it takes one-fortieth as much as it does to operate the free air forge with an ordinary blower. The pressure required is not high, in fact very low pressures have been used advantageously.

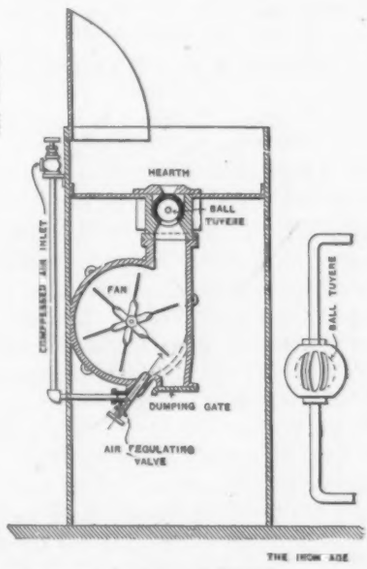


Fig. 2.—The Buffalo Compressed Air Driven Fan Forge.

The wide application of these forges for use on bridge and building construction, in large railroad and repair shops, and in fact wherever compressed air is available, will readily be appreciated, and the saving of time and labor in their usage, as well as the ease with which they may be connected by a small hose to the compressed air, should appeal to users everywhere. Although the Buffalo Forge Company makes both forges mentioned above, it recommends the compound compressed air operated on the injector principle, Fig. 1, because of the greater simplicity, economy and more rapid heating obtained.

The Proposed Cape Cod Canal.—The Boston, Cape Cod & New York Canal Company, which proposes to build the long talked of Cape Cod canal, has submitted plans to the Massachusetts Land and Harbor Commissioners, showing the scope of the proposed waterway, which will greatly shorten the water route between New York and Boston and points to the north, as well as eliminating perils of navigation. The northern approach is at Barnstable Bay, Sandwich, and from there the route is through Sagamore, Bournedale, Bourne and the Monument River to its mouth at Buzzards Bay. The plans call for a canal 100 feet wide at its bottom throughout and 250 feet wide at its entrances. The minimum depth will be 25 feet below mean water level. Riprap from 6 feet below mean low water to 6 feet above high water will protect the banks from the action of currents. No objection to the canal is raised by railroad interests, the only opposition being from land owners along the route, especially owners of summer residences.

The steel freighter and ore carrier Charles Weston, the latest addition to the Niagara Transit Company's fleet, was launched May 26 at the Bay City yards of the American Shipbuilding Company. The new steamer is 569 feet in length, with a capacity of 12,000 tons.

THE IRON AGE

1855—1906.

New York, Thursday, May 31, 1906.

DAVID WILLIAMS COMPANY, ... PUBLISHER
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GEO. W. COPE, ... }
A. I. FINDLEY, ... }
RICHARD R. WILLIAMS, ... HARDWARE EDITOR

The Iron Age Directory.

The David Williams Company is now mailing to all subscribers of *The Iron Age*, free of cost, a copy of the Tenth Annual Edition of THE IRON AGE DIRECTORY. It is a book of 318 pages, bound in red cloth, and contains a classified list under more than 6000 headings of the products of the 1400 regular advertisers in *The Iron Age*, thus covering the entire field of the Hardware, Iron, Machinery and Metal Trades. It is the most comprehensive directory of these industries published, including as it does many specialties which are not usually indexed and the sources of supply of which are ordinarily traced only with great difficulty. Year after year as one edition has followed the other THE IRON AGE DIRECTORY has conquered a large place in the appreciation of the trade and has become more and more an indispensable aid to those in charge of the office and the shop.

The Foundry Labor Problem.

The struggle in which the National Founders' Association and the Iron Molders' Union are now arrayed against each other is one in which compromise seems an unlikely outcome. While it is easily conceivable that agreement might be reached on middle ground as to wages and hours, the demand of the union for signed agreements with its various locals and the enforcement of the "no card no work" rule introduces a factor on which there is no middle ground. In that respect the contest is one for control. Through its shop committees the Iron Molders' Union has long wielded a powerful influence on the operation of foundries in which it has had recognition. In the past two years, in the leading foundry centers in which the National Founders' Association is well represented, the absence of a signed agreement has been looked upon as the badge of at least a slight curtailment of the union's power. The shop committees remained as before and the closed shop was still the rule, but the old formal agreement had expired in 1904, and the union, in view of the condition of its resources, apparently did not care to bring on a general test of strength.

The Philadelphia strike of last year was the one notable case in which recognition was made an issue. According to the officers of the Founders' Association the fact that the Philadelphia foundries have been successfully operated with nonunion men was one of the reasons for the present strike, the union calculation being that many of the men at work in Philadelphia would be drawn away and the situation saved for a further time from the moral effect of evident defeat in that important center.

The developments of the past two years in the foundry trade have shown that the hope at one time entertained that conciliation was to be advanced through the relations of the National Founders' Association and the Iron Molders' Union was not justified. Through the New York Agreement the Molders' Union had a footing of conference and a conciliatory relation with several hundred of the leading foundries of the country. Under wise and conservative action this might have led to long standing peace. The wage agreements to which the various local groups of National Founders' Association members were parties tended to eliminate the inequalities in foundry wages in different sections that in some cases had been so great as to cause demoralizing competition. Foundrymen who had always paid fair wages were not averse to the change. But as in the case of the Amalgamated Association before the Homestead war of 1892, an overreaching desire on the part of the molders for control of the foundry business, and their evident feeling that the employers were conciliatory only because they feared to try conclusions with the union, brought down in ruin the whole structure of peace.

In all the years of their conferences with the Iron Molders' Union, particularly between 1900 and 1904, the officers of the Founders' Association tried to get some avowal from the union indicating that it had progressed beyond the old unionism with its fixed day's work, its desire to limit even the output of expensive machines by putting them under union rules and its insistence on restricting the supply of skilled molders even below the ordinary needs of the trade. Conference after conference was held, and as the period in question was one of general prosperity the molders found no great difficulty in securing the advances they asked. The foundrymen asked in return some express statements indicating that progress was being made away from the hidebound and discredited tenets of early unionism. At the conference in February, 1901, that settled the famous Cleveland strike, some well turned rhetoric was incorporated in the agreement, that seemed to indicate that the campaign of education had not been lost on the union's officers. In practice the declaration amounted to nothing. Later an agreement was made at Philadelphia that was supposed to recognize a special wage differential for molders unable to earn the fixed minimum, and a concession was made on another point that gave the foundrymen reason to think the union was at least more amenable to reason. But when an effort was made to convert these fair promises into tangible shop conditions the rank and file of the union simply repudiated them. Similarly there was incorporated in several agreements sections bearing down on limitation of output by union decree. But the foundrymen still noticed that where the shop committee flourished most there record outputs were an unknown quantity.

It would seem that a third period has been entered upon in the relations of the Iron Molders' Union and the foundrymen. There were, first, the years of strife in which victories were won now by the union and again by individual employers according as trade conditions favored one side or the other; but all the time the power of the union increased. An interval of conference and diplomacy followed under the early *régime* of the National Founders' Association. It was characterized by a large degree of conciliation. The foundrymen were hopeful that friendly discussion might eventually result in some relief from the burdensome restrictions of the union, while the molders, steadily bent on the main chance, bore away from the conference room the trophies that before had been won by costly strikes. The third stage was really entered upon in 1904, but its characteristic features have only recently become clearly defined. It promises to be marked by strife like the period first described, with the irreconcilable differences in the positions of the two sides very clearly defined. But the indications are that, unlike the first period, it will be char-

acterized by more union defeats than victories. The industrial advance of the past 20 years is making more and more untenable the old-time union position. Sentiment has moved on, but the Iron Molders' Union has refused to move with it. Its failure to catch step with the modern industrial movement has demonstrated its unfitness for the control of the instruments of production at which it aims.

When the officers of the International Association of Machinists signed an agreement at New York in May, 1900, outlining a scheme of arbitration and virtually conceding the open shop, there was a great acclaim over the beginning of an era of good feeling in the machine shop. But the first practical test made wreckage of the agreement, and there has been strife in the machinery trades ever since, with the open shop steadily gaining ground. The members of the National Founders' Association sought to avoid what many of them considered the radicalism of the National Metal Trades Association after it had severed relations with the Machinists' Union, but to-day the two organizations are identical in attitude toward the unions of their respective trades. And out of it all is coming a steady increase in the number of open shops.

Great Britain as a Consumer of Iron.

The annual report of the British Iron Trade Association makes prominent two features of the iron trade of that country to which emphasis was given by the statistics of 1905. One is the generally unrecognized importance of the British home market for iron and steel, and the other the active campaigns for higher tariffs on imports which were carried on in other countries last year. We have been accustomed so long to hear of the manifest destiny of Great Britain as a manufacturer for the rest of the world that it sounds a bit strange to have stress laid by a British manufacturers' association on the value of the home market. The American reader looks twice to make sure he is not reading a document of the Home Market Club dealing with the unparalleled value of the American market. We are told that, while it is the common belief that Great Britain depends mainly on her foreign demand for the maintenance of her iron trade prosperity, the figures show that 60 per cent. of the total British output and imports of iron and steel in 1905 was consumed at home. The detailed statement is given as follows:

British Iron Trade in 1905.

Production and imports.		Tons.
Make of pig iron		9,592,737
Imports of iron and steel		1,355,929
Imports of old iron		23,198
Total		10,971,864
Exports.	Tons.	
Pig iron	981,891	
Steel, &c.	2,739,624	
Machinery, &c	546,000	
Hardware, cutlery, &c	150,000	
		4,417,515
Left for home consumption		6,554,349

It would probably be quite as competent to add imports of iron and steel in the form of machinery, as to deduct machinery, hardware and cutlery exported, so that the showing as to home consumption is if anything rather more favorable than the above. The report points out that on a population of 43,217,000 for the British Isles in 1905 the tonnage above figures out a per capita home consumption of 340 pounds of iron and steel last year. This is 28 pounds more than in 1904 and compares with a per capita consumption of 216 pounds, 15 years previously, or in 1890. The report of the British Iron Trade Association says: "This increase of home consumption is a very satisfactory feature of the trade, and it is reassuring to those engaged in it to feel that they are not mainly dependent on the wavering and uncertain demands of foreign countries."

Compared with a per capita consumption in the United States of 620 pounds of iron and steel in 1905, the record in Great Britain does not seem large; but an increase of more than 50 per cent. in 15 years is noteworthy in a country that has long been considered to have measured well up to its possibilities. Neither from increase in population nor from the development of natural resources can Great Britain hope to make a tithe of the gain in home consumption of iron that is certain to come to the United States.

One feature of the record of larger domestic consumption which the British iron trade cannot regard with complacency is the portion of the increase that has gone to foreign manufacturers. The report to which we have referred says that British imports of iron and steel increased from 323,840 tons in 1890 to 1,379,127 tons in 1905, while British exports of iron and steel in 1905 were 280,000 tons less than the exports of 1890. There is a connection between this showing and the statement in the report that in no previous year of the 30 years of the British Iron Trade Association had there been such remarkable activity in other countries in the direction of tariff changes. The association last year had to deal with actual or contemplated tariff changes in Germany, Austria, Roumania, Switzerland, Spain, Portugal and Russia, nearly all being in the direction of higher duties on iron and steel products. These tariff bars are made use of in negotiating for preferential treatment in outside markets, and the British Iron Trade Association again calls attention to the handicap upon Great Britain in a time when international tariff bartering is especially in vogue. As a free trade nation it has nothing to offer in exchange for special privileges. The report says that to the 16 principal countries of Europe British iron exports in 1904 were 905,000 tons, or about 50 per cent. less than in 1900. It is admitted that "this decrease is remarkable and not a little disquieting" and with no attempt to be cheerful over the outlook it is added that the tendency is likely to continue under the increasingly protectionist policies of European countries.

The Lack of Linguists in Business.

The demand in business lines for young men equipped with a good working knowledge of the modern languages is poorly supplied. Shortly after the war with Spain an agitation was begun in educational circles to establish courses in Spanish in high schools, that young men might be equipped to take part in the business development of our new colonial possessions. The idea was carried farther, to include modern languages generally, especially French and German, and a general stimulus was given to the training of young men to assist in the development of the foreign trade of the United States. The colleges took up the plan and courses were established or existing courses shaped to meet a new requirement. But after a little time something went wrong. Nothing was done to keep up the enthusiasm of the student. The whole plan was relegated to the background, with the result that the interest in this branch of specialized education has almost wholly subsided. This may not be the universal rule, but it is the general statement of educators.

Much attention is given abroad to this matter. There young men are specially trained for a career in foreign business or the consular service. The latter may be classed, of course, as an exceedingly important factor in developing foreign trade, if the right men, properly trained, are selected for consular offices. In the United

States little heed is given to these preliminaries, excepting as they may chance to come into the routine of general education. It is a rare case that any one in an American business house takes the pains to encourage a young man to continue to study modern languages beyond the classroom. It is seldom that a business office contains an employee who is able to translate a letter into French, or even to translate into English a letter received from a French or German correspondent. The remark is often heard that English will soon become the universal business language, but those whose business brings them in contact with foreign trade realize the weakness of depending on such a development, so far as it applies to the furtherance of trade now or within the next decade.

The factor which a knowledge of the languages will play in business, with the extraordinary development of the foreign trade of the United States, will have to be better recognized sooner or later. The demand will probably create the means of furnishing the supply, and the louder the demand the sooner it will be complied with. Just as the demand for skilled workmen is to-day compelling great attention to the establishment of adequate trade schools, so will the demand for skilled labor of this other sort compel the attention of educators to the training of linguists.

Chill in Cast Iron.

A paper was read before the Iron and Steel Institute at London, May 10, by E. Adamson on "The Influence of Silicon, Phosphorus, Manganese and Aluminum on Chill in Cast Iron." The author detailed some experiments he had made to determine the influence of the various metalloids on chill. To obtain comparative data the amount of total carbon was kept approximately at the proportion obtaining in air furnace practice. The quantities of the four above named elements were varied while the other constituents remained constant. Chemical analyses and the chief mechanical tests were made, and the temperature of casting and depth of chill were indicated. The results differed in some respects from those generally accepted. The general conclusion of the author is that the depth of chill is primarily dependent upon the percentage of combined carbon and the temperature of casting. It has been stated that the higher the graphitic carbon the lower the chill. But it is possible to have two irons equal in graphitic carbon and other elements, but differing in total carbon, and consequently in combined carbon, and in this case the higher total carbon would give the deeper chill by reason of the higher combined carbon. The author thinks it would be more accurate to consider the total carbon and combined carbon as definite factors, rather than to treat the graphitic carbon as a negative by reason of the possible variation in total carbon, and to consider the graphitic carbon more as an impurity or rather a separate constituent from combined carbon. Referring to the belief that silicon turns carbon into its graphitic form the author concludes from observations at the blast furnace that this conversion may be largely due to the temperature of manufacture and of casting.

While gray iron, usually high in silicon when high in graphitic carbon, undoubtedly remains in a molten condition in the ladle longer than white iron, and gray pig iron does not solidify as rapidly as white, yet the higher the silicon the more rapid is the rate of fall in the temperature of the molten metal. The author, while not disputing that silicon lowers the saturation point of carbon and iron, concludes that temperature plays an important part in this also within limits. It would naturally be inferred that No. 1 irons lowest in silicon would be highest in total carbon, but in his experiments silicon 0.35 per cent. was accompanied by carbon 3.28 per cent.; silicon 0.67 per cent. gave total carbon 4.23 per cent., and silicon 5.85 per cent. gave total carbon 3.14 per cent.

The experiments as to phosphorus indicated that this element "has some influence in reducing the percentage of combined carbon as it certainly has in reducing the depth of true chill, which would point more to a softening effect than a hardening one, as suggested by Keep, although it would be better perhaps to qualify this statement as 'within limits.'" It is stated, however, that there is so much difference of opinion as to the influence of phosphorus that the necessity appears for more complete research in this direction, including pyrometric data and recalescence curves.

Manganese seems to have a direct influence in retaining carbon in the combined state, and consequently increases the depth of chill. The figures showed that the higher the manganese the longer the metal retains its initial heat. Manganese does not appear to interfere materially with the transverse tests up to 1.17 per cent., although the deflection is lowered, but both the transverse strength and deflection are considerably reduced with further increases of manganese.

Concerning aluminum the experiments are considered sufficient to demonstrate clearly that by additions of aluminum white iron is converted into gray and the depth of chill is reduced. The aluminum experiments further showed the direct influence of casting temperatures on the depth of chill quite independent of the percentage of combined carbon in the gray portion of the casting.

In each pair of chills the deepest chill is at the highest temperature. A probable explanation is on the analogy of hot water freezing more quickly than cold. The hotter the metal coming in contact with a comparatively cold surface, the greater will be the reaction, hence the deeper the chill. While the chill at the higher temperature is deeper than at the lower, the combined carbon in the grey back is the same. This is also confirmed in the analyses of combined carbon in the aluminum chills.

Concerning the mooted question as to the relative value of charcoal and coke irons for chilled castings, it was stated that no results of tests had ever been given sustaining the view that charcoal irons are stronger. Coke irons have some high mechanical tests to their credit quite equal to those of ordinary charcoal iron and the author has used coke irons entirely. He believed that under proper treatment coke irons are as good as charcoal irons for high mechanical tests and depth of chill.

The Whitaker-Glessner Strike Settled.—On February 13, last year, this company's sheet mills at Wheeling, W. Va., closed down because the men working on a tonnage basis insisted that they should work under different conditions from those prevailing in other sheet mills in which the Amalgamated Association scale was signed. There was no effort on the part of the company to resume operations for several months, but when some non-union men were taken into the plant the Amalgamated Association then declared a strike, which was afterward declared off. The company allowed its plant to remain idle until the men had thoroughly satisfied themselves that the company was right in its contentions and was only asking that its sheet mills be operated under the same conditions that prevailed in other sheet mills where the Amalgamated scale is signed. Last week the company and its employees got together, a settlement of the trouble was effected and the plant has been started. The resumption of operations restores the cordial relations that had previously existed between this company and its men. The Whitaker-Glessner Company manufactures iron and steel sheets and has two works—the Whitaker department at Wheeling, W. Va., and the Martins Ferry department at Martins Ferry, Ohio.

As yet the machinists in the Pittsburgh district, who have made a demand for an 8-hour work day and a starting rate of 40 cents an hour, to take effect July 1, have not gone on strike. The employers have refused to grant the demand, and what the machinists will do before July 1 is uncertain. No conferences have yet been held between employers and machinists and no arrangements are under way for one.

New Publications.

The Principles and Practice of Iron and Steel Manufacture. By Walter Macfarlane. 12 mo. Pages, 266. Illustrations, 90. Price, $1.30. Published by Longmans, Green & Co., London and New York.

The past few years have been prolific in iron and steel literature in book form. The Turner volume of several years ago was followed by the comprehensive Harbord and Hall work on steel. Only recently a text book on the "elementary practical metallurgy" of iron and steel was put out in England. More of a bent for the production of such literature exists in Great Britain than in the United States. Percy, in the sixties, and later, Bell, set up the standards. Here Howe's encyclopædic work on steel, brought out at the end of the eighties, and Campbell's monumental "Manufacture and Properties of Iron and Steel," of more recent years, stand out prominently. But it is noteworthy that the work that gives more details about the mechanical and other features of American iron and steel works of the twentieth century than are contained in any other volume is a British production, namely, the report of the commission of the British Iron Trade Association that in 1901 investigated the causes of the rapid advance of the American steel trade to a position that appeared to be threatening.

The chief fault an American reader will find with the book before us is that it is strictly a record of British practice. The chapter on ores, for example, tells the reader about "clayband ironstone," "blackband ironstone," "Cleveland ironstone," &c., and the British deposits of these various ores are indicated. Coming to pig iron, the same provincial groove is followed. "Foundry and forge pig irons are made from blackband, clayband and Cleveland ironstones," &c. That the work was originally prepared for text book use in technical institutes is indicated by many features, including the reproduction in the appendix of the three years' course of instruction in iron and steel manufacture provided for the City and Guilds of London Institute. It is essentially a British author's description of British practice for the use of British students. But many of the views of British works are not valuable, except in a historical way, to the reader on this side of the ocean, who would find in plants built in the United States in the past few years a state of the art several lengths in advance of the illustrations. The mechanical features of modern iron and steel manufacture are conspicuous by their absence. It is scarcely a twentieth century treatment of the blast furnace that devotes pages to the furnaces of our fathers and then crowds into 11 lines at the end of the chapter this sweeping reference to present day practice:

> Within recent years there have been considerable developments in the equipment of blast furnaces. Water for cooling is now plentifully supplied. There has been a liberal augmentation of blowing and heating power. Charging is expeditiously performed by means of electrically propelled skips which quickly travel on aerial rails and discharge through a rotating distributer into the furnace, the whole being controlled by one man at the bottom. Costly machines for "casting" the iron into pigs as it comes from the furnace, or cranes for removing the pig iron from the sand beds and breaking and delivering into trucks, have also been provided.

In other parts of the book similar stray references creep in to departures from the practice of other decades. In describing the manufacture of crucible steel for tools and cutlery, the author says that "the iron used is brought from Sweden." Then in a footnote is the naive observation: "Some American steel makers believe that Swedish iron is not necessary." "Belief" is a mild term for the robust fact in this connection.

It is stated in the preface that, contrary to the usual procedure in such text books, finished materials are discussed first and iron ores last. But the advantage of departing from the logical order is not apparent. As a condensation of voluminous treatises on the metallurgy of iron and steel the book is to be commended, for the author has done some admirable work in the presentation of the principles of iron and steel manufacture. The metallurgical side receives in the main clear and adequate treatment, albeit some of the statements here have been too much condensed for definiteness. But in respect to practice—that is, modern practice—it would appear that the student is entitled to something more.

Metallurgical Calculations.—By Joseph W. Richards. Pages 208, 6¼ x 9⅛ inches. Price, $2 net. Published by the McGraw Publishing Company, New York.

For the most part the contents of this book are reprinted from the series of articles published in the *Electro-Chemical and Metallurgical Industry*. The volume constitutes part 1 of these articles. Part 2 is now being printed serially, and part 3 will appear serially in 1907. The present work deals with chemical and thermal principles and with problems in combustion. The chapter headings are as follows and will indicate the character of the contents: Chapter 1, "The Chemical Equation." Chapter 2, "The Applications of Thermochemistry." Chapter 3, "The Use of Thermochemical Data." Chapter 4, "The Thermochemistry of High Temperatures." Chapter 5, "Thermophysics of Chemical Compounds." Chapter 6, "Artificial Furnace Gas." Chapter 7, "Chimney Draft and Forced Draft." Chapter 8, "Conduction and Radiation of Heat." The author has brought together data of great value to the metallurgist, particularly at a time when heat treatment is receiving more study and its phenomena are better understood than at any previous period in the history of metallurgical operations. The chapters on thermochemistry reflect the recognition now given to the importance of initial gas temperatures in heating processes with a critical temperature. Only in recent years have specific heats at high temperatures been determined, and it is thus possible to avoid the old errors as to higher temperatures, which in some cases amounted to hundreds of degrees. The chapter dealing with artificial furnace gas takes up calculations of the volume of gas produced per unit of fuel, the calorific power of the gas compared with that of the fuel from which it is produced, the heat losses in the operation of converting solid fuel into gaseous fuel, the limits on the use of steam and the advantages gained by gasifying the fuel rather than burning the solid fuel directly. The author gives in detail the solutions of 47 different problems in thermal computations, of special value to those who have to do with melting furnaces, heating and puddling furnaces, cupolas and gas producers.

Tables for the Use of Blacksmiths and Forgers.—By John Watson. Pages 88, 4½ x 6⅛ inches. Price, 90 cents. Published by Longmans, Green & Co., London and New York.

The author has tabulated in convenient form the results of nearly every possible drawing down or staving operation, together with hoop lengths and the weights of iron and steel bars for a large range of sections. Emphasis is put on the necessity of knowing with reasonable accuracy what allowance should be made in drawing down from a larger section of metal. If the smith commences to draw too long a portion at the larger diameter the correct length is reached before the diameter of the small part is sufficiently reduced, and there must be cutting, with waste. Conversely, if too short a part is operated on at first the job is still short when the correct diameter is reached. Accompanying the tables are a number of examples in reductions of sections and in computation of weights of forgings of various dimensions.

The Railroad Manual Appendix and Diary.—Pages 284, 6 x 9 inches. Published by Poor's Railroad Manual Company, New York.

This is the sixth annual number of this work. It supplements "Poor's Manual" for 1905 and contains a ready reference bond list for the railroads of the United States, arranged alphabetically, information as to annual meetings of steam and street railroad companies and miscellaneous industrial corporations, a list of registrars of stock and of stock transfer agencies, also a table of dividends paid in the years 1898 to 1905, inclusive, by railroad companies and industrial corporations. Condensed statistics of steam railroads in the United States are presented as compiled from "Poor's Manual of Railroads" for 1905, and similar statistics of street railroads in the United States from the same source.

A New and Drastic Eight-Hour Bill.

WASHINGTON, D. C., May 29, 1906.—A determined effort is being made by the representatives of organized labor, led by President Gompers of the American Federation of Labor, to force through Congress in the closing days of the present session the most drastic eight-hour bill that has ever been seriously considered by either house. The manufacturers of the country, who have been advised of this movement, regard it with no little concern, and the committee has received a large number of protests against the enactment of the bill and requests for hearings before it is taken up in executive session. During the past week J. H. Hayden, representing the Carnegie Steel Company and a number of other manufacturing concerns; L. E. Payson, counsel for the Newport News Shipbuilding & Dry Dock Company, and Daniel Davenport, attorney for the American Antiboycott Association, have appeared before the committee. During the present week the committee will hear F. W. Hutchins of Detroit, secretary of the National Founders' Association; W. B. Cowles of the Long Arm System Company, Cleveland, Ohio; H. C. Hunter, commissioner of the New York branch of the National Metal Trades Association; E. F. Du Brul, representing the Cincinnati branch of the National Metal Trades Association; Wallace Downey, late of the Townsend-Downey Shipbuilding Company, Brooklyn, N. Y., and others.

Text of the Bill.

The bill now under discussion has been introduced by Representative Gardner of New Jersey, chairman of the Committee on Labor, and differs from the so-called Hitt-McComas bill which has been under consideration in the past two Congresses, in that a number of exemptions and limitations designed to render the measure less drastic have been eliminated, leaving it crude in form and harsh in its terms. The text of the measure is as follows:

That each and every contract hereafter made to which the United States, any Territory or the District of Columbia is a party, and every such contract made for or on behalf of the United States or any Territory or said District, which may require or involve the employment of laborers or mechanics, shall contain a provision that no laborer or mechanic doing any part of the work contemplated by the contract, in the employ of the contractor or any subcontractor contracting for any part of said work contemplated, shall be required or permitted to work more than eight hours in any one calendar day; and each and every such contract shall stipulate a penalty for each violation of the provision directed by this act of $5 for each laborer or mechanic for each and every calendar day in which he shall labor more than eight hours; and any officer or person designated as inspector of the work to be performed under any such contract, or to aid in enforcing the fulfillment thereof, shall, upon observation or investigation, report to the proper officer of the United States or any Territory or the District of Columbia all violations of the provisions in this act directed to be made in each and every such contract, and the amount of the penalties stipulated in any such contract shall be withheld by the officer or person whose duty it shall be to pay the moneys due under such contract, whether the violation of the provisions of such contract is by the contractor, his agents or employees, or any subcontractor, his agents or employees. No person, on behalf of the United States or any Territory or the District of Columbia, shall rebate or remit any penalty imposed under such provision or stipulation herein provided for, unless upon a finding which he shall make up and certify that such penalty was imposed by reason of an error in fact.

Nothing in this act shall apply to contracts for transportation by land or water, nor shall the provisions and stipulations in this act provided for affect so much of any contract as is to be performed by way of transportation, or for such materials as may usually be bought in open market, whether made to conform to particular specifications or not. The proper officer on behalf of the United States, any Territory or the District of Columbia may waive the provisions and stipulation in this act provided for as to contracts for military or naval works or supplies during the time of war or a time when war is imminent. No penalties shall be exacted for violations of such provisions due to extraordinary emergency caused by fire or flood, or due to danger to life or loss to property. Nothing in this act shall be construed to repeal or modify chapter 352 of the laws of the Fifty-second Congress, approved August 1, 1892, or as an attempt to abridge the pardoning power of the Executive.

The Measure Sharply Criticised.

James H. Hayden, representing the Carnegie Steel Company at the hearing referred to, made a strong statement. Under the pending bill, he said, if an employee worked for five minutes on a Government contract he could not thereafter in any one calendar day work more than 7 hours and 55 minutes on private work, even though a part of such private work were performed for another employer. Several new members of the committee were inclined to question this construction of the bill, but it was substantially indorsed by Chairman Gardner, the author of the pending measure. Continuing, Mr. Hayden said: "The result of such limitations as are embraced in this bill would be that all of the larger firms of the country would withdraw from Government work. They would do that for the reason that they could not adopt the eight-hour rule and still compete in the domestic or foreign trade. They would abandon Government work altogether." Judge Payson's argument on behalf of the Newport News Shipbuilding & Dry Dock Company was also a strong one. It is expected that the hearings on the bill will occupy another week or ten days, after which its opponents will seek to have it indefinitely postponed, while its advocates will urge an immediate report. The membership of the committee has been completely recast since the last Congress, and it is impossible to foreshadow the outcome, although the opponents of the measure express confidence in their ability to prevent a favorable report at this session. W. L. C.

A Good Outlook in the British Iron Market.

Late reports from British iron trade centers speak of considerable activity in the pig iron market. This is seen, not only in speculative business, but there is better buying by actual consumers, who are more disposed to contract for future delivery than at any time since the early spring. An important feature of the situation is that Germany continues to take large quantities of foundry and basic iron from the Cleveland district. It is stated that shipments of Cleveland pig iron have never been at a greater rate than reported this month. In only two years in the history of the Cleveland district has Germany bought more freely than in the past two months. Stocks of pig iron in Connal's public stores were 687,999 tons of Cleveland iron on May 17, a decrease of 12,714 tons since May 1, and of 62,094 tons since March 5, when the decrease in stocks began. The warrant market has shown a slight advance in price. In the finished iron and steel trade, while new business is not quite as plentiful as could be desired, there is still a large tonnage booked ahead. The shipbuilding industry is quite active and promises to call for a liberal amount of material for some time to come. Prices in finished lines are generally well maintained.

Wm. H. Burtner, who had been prominent in machine tool manufacture for a number of years, died at Cincinnati on May 17. His first connection was with the Lodge & Davis Machine Tool Company; later he was vice-president of the reorganization company, the American Tool Works Company. In 1897 he retired from this company and in 1898 organized the Cincinnati Planer Company. He was its president until November, 1904, when he disposed of his interest because of ill health.

Iron ore briquettes are now being successfully manufactured by the Edison process at the works of the Dunderland Iron Ore Company at Guldsmedvik i Ranen, Norway, and shipments are being made to some of the Tees-side furnaces in Great Britain.

The Building Trades Employers' Association of Hudson County, which covers practically all the trades in Jersey City, N. J., except the painters and carpenters, decided on May 28 to uphold the action of the Board of Governors of the association in declaring for the open shop. This will mean an almost complete tieup of building labor in Jersey City, and will affect 5000 to 6000 men.

Owing in part to the high price of tin, the operation of tin plate works in South Wales has declined recently. At the end of April 375 mills were working, as compared with 401 in March, 1906, and 408 in April, 1905.

NEWS OF THE WORKS.

Iron and Steel.

The Republic Iron & Steel Company has acquired property near the Youngstown works of the National Tube Company for a distance of nearly two miles along the Mahoning River, which it will use for the building of new works, possibly rod, wire and wire nail mills.

The Lockhart Iron & Steel Company, Pittsburgh, works at McKees Rocks, and manufacturer of refined iron bars, is making some large additions to its plant. These include new puddling and heating furnaces, two new bar mills and the installation of a large engine. It is the intention of this company to increase its capacity fully 50 per cent. The additions now under way are expected to be completed in July.

It is the intention of the Empire Iron & Steel Company, Niles, Ohio, which has recently been organized, to engage in the manufacture of sheets for electrical purposes and highly polished sheets of the very best grades. It is also probable that it will put in mills for the rolling of hoops and bands. The report that the company will make metal lathing is untrue.

We can state on the authority of H. C. Frick of Pittsburgh that the report that he is actively interested in a large new steel plant to be built at Camden, N. J., is absolutely without foundation.

George D. Todd has bought at auction the plant of the Louisville Bolt & Iron Company, Louisville, Ky., for $58,000. The plant is well equipped and can be put in operation in a few weeks. The new owner intends to organize a company to operate the plant, manufacturing bolts, running the guide mill to make its own supply of bars and rods. There is a new sheet mill connected with the plant, which has never been operated and which has the latest 'mprovements, being equipped with six Wickes 150 horse-power boilers. This sheet mill will be sold.

General Machinery.

The A. D. White Machinery Company, which has succeeded the J. H. Dawson Machinery Company, Chicago, has incorporated with a capital stock of $20,000. The incorporators are Andrew D. White, Frederick R. Sargent and Marcus Hitch. Mr. White was associated with Mr. Dawson for six years and has had much active experience in the machinery business. The new management will add several new lines of tools, securing several of the best agencies in the country. The capital stock will later be greatly increased. Mr. Dawson had been engaged in business for over 14 years and was finally forced to retire by reason of ill health.

Toledo & Chicago Construction Company, Kendallville, Ind., has installed a 12-ton Northern traveling crane, manufactured by Northern Engineering Works, Detroit, Mich.

The Battle Creek Iron Works Company's plant, located on South Jefferson avenue, Battle Creek, Mich., has been sold at public auction, the bidders being the bondholders, who were represented in the transaction by Wm. D. Hayes, trustee, of Hastings, Mich. The amount paid was something over $30,000, being approximately the amount of bonded indebtedness. The valuation of the plant at inventory was placed at $106,000.

The Deister Concentrator Company has been incorporated at Ft. Wayne, Ind., with $200,000 capital stock, by Emil Deister, Wm. H. Bensman and Walter G. Burns. The company manufactures concentrators.

Power Plant Equipment.

The Canadian Westinghouse Company, Limited, Ontario, Canada, is doing a large business in steam turbo-generator equipments. The Northern Electric & Mfg. Company, Montreal, duplicated an order recently for a 300-kw. Westinghouse-Parsons turbo-generator unit, to be installed in its power house alongside of one of the same capacity now in service. The present turbine is operating part of the year condensing and through the winter noncondensing, the exhaust steam being used during the winter for heating purposes. It was the splendid operation of this steam turbine generator unit which led the company to order the one about to be installed. The company is installing three 5000 horse-power alternating current water wheel driven generators and transformers in the plant of the Provincial Light, Heat & Power Company, Montreal.

The Penn Hardware Company, Reading, Pa., is installing a 150 horse-power Koerting gas engine to be run on producer gas. This engine is supplied by the De La Vergne Machine Company, New York, which has also received an order from the Massachusetts Talc Company, Boston, Mass., for two 125 horse-power Hornsby-Akroyd oil engines to drive general machinery by belt.

The Westinghouse Machine Company, East Pittsburgh, Pa., has recently received an order from the Portsmouth Street Railway & Lighting Company to install in its plant at Portsmouth, Ohio, a 500-kw. turbine. Two 400-kw. Westinghouse-Parsons turbines are already operating at this plant, serving the entire city with light and power. The plant was built entirely for turbine machinery. Superheated steam and high vacuum are used. Steam turbines of the same make as those installed at Portsmouth have been adopted by the Durham Traction Company, Durham, N. C., and the Columbia Electric Street Railway Company, S. C., for traction service.

The Harris Auto Marine Company has been incorporated at Buffalo, N. Y., with a capital of $100,000, to manufacture engines and appliances. Directors are Byron P. Angell, Wm. D. Chamberlain, Dayton A. Minard, Barnett W. Harris and Herbert A. Pullen.

Crocker-Wheeler Company, Ampere, N. J., recently shipped direct to San Francisco a carload of form L motors ranging in outputs from ¾ to 3 horse-power, to be used in the rebuilding of San Francisco. These motors are being sold from the company's temporary office at 2611 Broadway by H. C. Baker, manager in the San Francisco territory, who gives his personal attention to all propositions. The company is now building at its plant at Ampere, N. J., the fourth or last of the 4000-kw. alternators ordered by the California Gas & Electric Corporation. Three of these machines installed in the suburbs of San Francisco successfully weathered the recent disaster.

The Flora Waterworks Company has been organized and incorporated at Flora, Ind., with $25,000 capital stock, to construct waterworks. The directors are Edward G. Kitzmiller, Martin W. Eaton and Chas. Voorhees.

The Town Council of Sheridan, Ind., has ordered plans for an electric light plant.

The Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa., has received an order from the Cincinnati Car Company for equipment for the Ohio Traction Company and Indianapolis & Western Traction Company for 2000 horse-power steam turbines. The company has also received a contract for electrifying 57 miles of street railroad in St. Petersburg, Russia, making its contracts in that city approximately $7,000,000. It 's building two large electric generators, to be driven by Westinghouse engines, ordered by the Panama Railroad Company, to be used in building the Panama Canal.

Foundries.

The American Radiator Company is putting up a $12,000 addition to its Bond plant on Rano street, Buffalo, N. Y.

Rufus K. Jordan, Westbrook, Me., iron founder, is adding 35 feet to his foundry, and will install another furnace, which will be ready for use in a few weeks. All equipment has been purchased.

There is no truth in the report that the Delawanna steel casting plant of the Cooper-Wigand-Cooke Company, Passaic, N. J., has been sold. The company, however, has the plant in the market for sale.

Fires.

The wheel foundry of the Dixon Car Wheel Works, Houston, Texas, was burned last week. The loss is placed at $10,000.

The plant of the Chicago Wooden Ware Company, Chicago, Ill., was burned May 23 with a loss of $50,000.

The works of the Toronto Bolt & Forging Company, Toronto, Ont., were burned May 22 with a loss of $100,000.

The Kent avenue power house of the Brooklyn Rapid Transit Company was seriously damaged by an explosion on May 27.

The paint and varnish factory of Howe & French, Weymouth, Mass., was damaged to the extent of $6000 by fire May 25, the loss including a 30 horse-power boiler, which exploded.

Hardware.

The Union Horse Nail Company, New Haven, Conn., has increased its capital stock from $150,000 to $300,000, the purpose of the new capital being to expand the business. The plant, both buildings and equipment, was practically doubled recently. A higher grade of nails is being manufactured.

The Gaynor & Mitchell Mfg. Company, Bridgeport, Conn., has been incorporated with capital stock of $60,000. The incorporators are Arthur C. Gaynor and Joseph F. Gaynor, Bridgeport, and Angelo Gaynor, New York. The business was formerly carried on as a co-partnership. The concern was established in 1887, and manufactures special articles of sheet metal, rod, wire, tubing, &c.

The Proctor-Raymond Mfg. Company, Detroit, Mich., has incorporated to manufacture electric bells, trunk trimmings, electrical and hardware specialties. A site having a frontage of 460 feet has been purchased for a plant.

The Hoopeston Horse Nail Company, Hoopeston, Ill., which has been operating for a number of years under the Dodge hot forged process, has recently replaced all of its machinery, putting in the Perkins patent cold forged process, and with the present equipment the company is producing double the former output. The Perkins process has been in use in Canada for seevral years, and Mr. Perkins has sold his stock in the Canadian company and resigned his position as manager to become interested in the management of the Hoopeston company. The Hoopeston plant will be still further enlarged in the near future, as the demand is beyond capacity.

The Marion Iron & Brass Bed Company, Marion, Ind., will erect a new iron bed plant, costing, in buildings and equipment, about $50,000. The buildings will comprise about 80,000 feet of floor space and will be constructed of reinforced concrete. Overhead trolleys and tracks will be installed and also link belt

machinery. Electrical power will be used, and a complete industrial railroad track system will serve the plant. Louis H. Gibson, Indianapolis, is the architect, and will have plans and specifications ready about June 1. Hugo Diemer, Indianapolis, is consulting engineer, and will receive figures on the equipment.

The International Mfg. Company, Worcester, Mass., has been organized to manufacture a new ratchet drill, the invention of Napoleon R. Thibert of that city. The officers are: President, George A. Reed, 34 State Mutual Building; treasurer, William E. Thompson; directors, these officers and Napoleon R. Thibert. The company has not yet begun to manufacture for itself, but it putting the drill on the market from an outside shop.

The Pague Mfg. Company, Kansas City, Mo., which was organized about a year ago for the manufacture of lard pails and cans, pieced tinware, fruit cans, oil cans, specialties, &c., has been obliged by the growth of its business to materially enlarge its manufacturing facilities. A site has accordingly been purchased on which the company will erect a four-story building 50 x 90 feet, which, with another building already on the ground, will add greatly to the company's capacity.

The Falls Rivet & Machinery Company, Cuyahoga Falls, Ohio, has bought the property of the Kearney & Foote File Company at Kent, Ohio, and is equipping a plant for the making of rivets and bolts. It expects to be turning out these goods about August 1.

Miscellaneous.

A. H. Wells & Co., Waterbury, Conn., manufacturers of small tubing, are to erect an addition to their factory, 35 x 51 feet, for a muffle room.

The Worcester Plunger Elevator Company, Worcester, Mass., manufacturer of plunger elevators, has been incorporated in Massachusetts with capital stock of $50,000, of which $30,000 has been paid in. The company will carry on the business formerly conducted by the Dean-Whiting Elevator Company. M. A. Wheeler, Worcester, is president and George H. Stevens, Boston, secretary and treasurer.

A. T. Wall & Co., manufacturers of rolled plate, seamless wire and tubing, Providence, R. I., have incorporated as the A. T. Wall Company.

The Stevens-Duryea Company has been incorporated in Massachusetts to carry on the manufacture of the Stevens-Duryea automobile, which in the past has been conducted as a department of the J. Stevens Arms & Tool Company, Chicopee Falls, Mass. The new corporation has a capital stock of $300,000, and the officers are: President and treasurer, I. H. Page; vice-president, J. F. Duryea; clerk, William M. Remington, who with Charles P. Fay constitute the Board of Directors. No changes in the Chicopee Falls works are contemplated.

The Monarch Mfg. Company has been organized at Stamford, Conn., and will establish a factory in that place. The company will manufacture a universal test indicator. The officers are: President, J. E. Allcott; vice-president, E. Everett Rowell; secretary and treasurer, H. B. Lanyon.

The by-product plant of the Milwaukee Coke & Gas Company was destroyed by fire May 20, entailing a loss estimated at about $10,000, fully covered by insurance. The coke ovens were not affected, although the burning of the by-plant building causes a temporary suspension in the manufacture of coke. Until repairs are made Milwaukee orders will be supplied from the ovens at Chicago, Pickands, Brown & Co. being the selling agents for both plants.

The Allis-Chalmers Company, Milwaukee, Wis., announces that it has entered into an arrangement with N. A. Christensen, a well-known Milwaukee inventor and mechanical engineer, to manufacture a new style of air brake and air compressor, invented some time ago by Mr. Christensen. The patents are those under which the air brakes of the National Electric Company were manufactured and which at the time of the sale of the bankrupt company were forfeited to Mr. Christensen, who has now granted a license covering the exclusive rights to manufacture and sell in the United States and Great Britain to the Allis-Chalmers Company. Mr. Christensen will be in charge of the new department, and arrangements will be made at once to manufacture on a large scale at the new West Allis plant.

The recently incorporated Kelly-Arnold Mfg. Company, Wilkes-Barre, Pa., is now manufacturing in a small way an automatic air and steam coupler which couples the lines of various cars of a train automatically, doing away with the rubber hose. The company expects to close negotiations soon for a large plant. The officers and directors are G. F. Royer, president; J. J. O'Donnell, secretary; Philip Reilly, treasurer; M. J. Healy, George E. Kelly, Joell Arnold and John T. Lanahan.

The Missouri Supply & Equipment Company, St. Louis, Mo., has been organized to carry on a general contractor's railroad supply and equipment business, and now has on hand several hundred second-hand and rebuilt cars of various descriptions, locomotives, several steam shovels, &c. The company is the exclusive agent for the Continental dump car. C. E. Eustic is president; W. H. Glasgow, vice-president and treasurer, and C. C. Collins, secretary.

The Parkersburg Bending Company, Parkersburg, W. Va., which has an extensive plant on the river, has been taken over by the Ohio Valley Bending Company, which will continue the business on a more extensive scale with increased capital. The officers are John M. Crawford, president; J. B. Finley, secretary, and G. A. Carver, treasurer.

The Higgins Spring & Axle Company, whose plant at Racine Junction, Wis., was recently burned, expects to have plans ready very shortly for rebuilding. The company will not require either boiler or engine, but will want a 100-kw. generator and probably eight or ten motors.

The Orient Coke Company, Uniontown, Pa., has elected Julian Kennedy president, Robert Bentley vice-president, Reid Kennedy secretary and treasurer and O. W. Kennedy general manager.

The Kokomo Brass & Plumbing Company, Kokomo, Ind., will erect a plant, of which the main building and foundry will be the first to be erected. J. W. Johnson is secretary of the company.

The Rex Shield & Mfg. Company has been incorporated at Connersville, Ind., with $25,000 capital stock, by O. C. Hull, S. E. Leiter and E. W. Arnold, to manufacture vehicles, vehicle parts and specialties.

The South Bend Drainage & Construction Company has been organized and incorporated at South Bend, Ind., to do steam dredging, bridge work, pile driving, &c. Wm. Augustine, president.

The Honeywell Heating Specialty Company has been incorporated at Wabash, Ind., with $25,000 capital stock, to manufacture heating and plumbing supplies. The directors are M. C. Honeywell, J. C. Teague, M. D. Tillman and H. H. McNamee.

The Indianapolis Aluminum & Brass Company has been incorporated at Indianapolis, Ind., with $10,000 capital stock, by John G. Blackwell, Patrick W. Kennedy and Ernest M. Blue.

The Eager Mfg. Company has been incorporated at South Bend, Ind., with $50,000 capital stock, to make articles of metal and wood. The directors are Eugene M. Herr, Harry B. Eager and Harold E. Herr.

PERSONAL.

W. K. Bixby, chairman of the board of directors of the American Car & Foundry Company, St. Louis, Mo., has announced his intention of resigning at the meeting to be held in June. He will, however, continue as a director of the company.

Among those elected to membership in the Iron and Steel Institute at the recent meeting in London are the following from the United States: Stephen Baciam, Steelton, Pa.; Alfred William Gregg, Bucyrus Company, South Milwaukee, Wis.; John Armstrong Rawlins, Naylor & Co., New York; Chas. G. Roebling, president John A. Roebling's Sons Company, Trenton, N. J.; George W. Sargent, Carpenter Steel Company, Reading, Pa.; Chung Yu Wang, New York; Geo. B. Waterhouse, Lackawanna Steel Company, Buffalo, N. Y.; Henry J. Williams, Philadelphia, Pa.

B. L. Keen, who has been manufacturing machinery for the National Drill & Mfg. Company, as superintendent of the National Department of the Stirling Company, Barberton, Ohio, for the past 18 months, is now open for a new connection, that business having been disposed of and the plant adapted to the use of the Stirling Consolidated Boiler Company. His present address is Annapolis, Md.

Dr. Héroult, the leading European manufacturer of aluminum and the well-known inventor of the electric steel furnace, has sailed for home. Dr. Héroult has fully recovered from an attack of pneumonia, which confined him to his bed for three weeks.

James J. Campbell, auditor of the Carnegie Steel Company, Pittsburgh, has been elected director of the South Side Trust Company of that city.

Henry C. Frick has offered to give $100,000 toward a building fund for the Young Women's Christian Association of Pittsburgh, providing that an additional sum of $200,000 is raised within a year for this same fund, and that further he would give $100,000 toward an endowment fund, providing that $200,000 is raised in two years by the friends of the institution.

H. D. Evans, for the past five years Boston manager of the Crucible Steel Company of America, has resigned his position and has organized the H. D. Evans Steel Company, 65 Oliver street, Boston, Mass. He will carry a full line of merchant steel, consisting of high grade tool and crucible steels in bars and sheets and an assorted line of open hearth machinery screw stock and shafting.

The Iron Molders' Strike.

Open Shop Notices Posted.

Eighteen Chicago foundry firms have posted the following notice and have inserted it as an advertisement in a Chicago daily paper: "The undersigned members of the Chicago branch, National Founders' Association, propose to operate their foundries hereafter strictly as 'open shops.' Competent molders will receive fair treatment, good wages and steady employment, based wholly on merit and efficiency. No shop committees will be allowed to dominate our foundries. No restriction of output will be tolerated. Worthy boys who desire to apprentice themselves to the molder's trade without union restrictions will be encouraged. If any of our desirable former employees who left our employ at the time of the strike of May 1, 1906, on our refusal to sign a closed shop agreement, desire to return to work, they can do so on the above conditions and no other. We make this statement public and emphatic, so that any of our loyal molders, with whom we have no dispute, will know exactly what to expect if they care to return to work."

Seventeen foundries in Milwaukee, from which members of the Iron Molders' Union have gone on a strike, have posted the following notice: "Hereafter our plant in all departments will be run strictly as an open shop and no contracts or agreements of any kind will be made with trade unions. We will hire our employees individually. We will pay fair wages. We will treat our employees justly at all times and require the same treatment from them." In these shops a number of independent molders and handy men have been put to work and the output has been increased in the past week. One foundry heretofore employing 60 men reports that 50 per cent. of its normal output has been turned out with 16 men in the past week.

The notices in Minneapolis and St. Paul shops read as follows: "Henceforth this shop will be run as an absolutely open shop, and any man who seeks employment in this shop will not be laid off except for incompetency or lack of work."

The foundrymen of Lawrence, Mass., announced the open shop in these terms, under date of May 22: "In answer to the communication received from the Iron Molders' Union of North America, dated May 19, 1906, will say this shop has decided not to grant the request asked for, and has furthermore determined that on and after June 4, 1906, this shop shall be run as an open shop."

The Situation at Pittsburgh.

The union molders in the Pittsburgh district who have demanded an increase in minimum wages, from $3.30 to $3.50 per day of nine hours, and that molders now receiving $3.50 per day be advanced 20 cents per day, have not yet gone on strike, but threaten to do so on June 1. In addition to the above demands, the molders ask time and half for overtime and double time for Sundays and all holidays. The employers have refused to grant these demands, and will not confer with the men as a union body, but only as individuals. They also demand open shop and the right to employ molders whether they are affiliated with labor organizations or not.

For the purpose of discussing the questions at issue a mass meeting of molders and employers was held in a theater in Pittsburgh on Sunday afternoon, May 27. W. H. McFadden of Mackintosh, Hemphill & Co., presided, and about 25 founders were present and about 150 molders. Isaac W. Frank, president of the United Engineering & Foundry Company, addressed the meeting and stated that the foundrymen would not deal with the workmen collectively on the wage question and would not recognize labor unions. The meeting had been called in order that the manufacturers be afforded an opportunity to speak directly and individually to the employees and not state their case through a committee of the workers' union. He said that the employees of the foundries in the Pittsburgh district are receiving better pay than the men in a number of other cities, and that the rules governing the molders and coremakers laid down by the labor organizations are a mere protection for incompetent and lazy workmen and prevent a mechanic from earning more than $3.30 a day, where in many cases he should be paid as high as $6 a day. He further said there are not enough molders in Pittsburgh, as a result of the stringent rules of the unions. Mr. McFadden spoke along the same lines as Mr. Frank.

Further Demands at Various Points.

The molders of Newark, N. J., have asked for an advance to $3.25 a day, and the coremakers to $3 a day, effective June 1, with signed agreement. The demands have been the subject of conference in the past week.

Dayton, Ohio, molders have asked nine hours instead of ten, an increase for floor molders from $2.90 to $3 and for bench molders from $2.65 to $2.75, a $2.75 minimum for coremakers, the abolition of piecework, the union ratio of apprentices and a closed shop agreement. The foundrymen held a meeting and decided to resist the demands. They will not deal with the union's representatives. Nearly 400 men are involved.

Philadelphia foundrymen report that notwithstanding that the present widespread strike was made to induce the National Founders' Association to withdraw its contract men from Philadelphia, thus crippling the shops whose men went out on October 27, 1905, the situation there remains practically unchanged, the foundrymen continuing to get about normal results.

Winnipeg, Manitoba, molders have asked for an advance to 35 cents an hour and coremakers to 30 cents an hour for a ten-hour day, with the stipulation that members of shop committees are not to be discriminated against. About 100 men are affected.

At Columbus, Ohio, the union molders have asked a reduction in hours from ten to nine, and an increase from $2.85 to $3 for molders and from $2.50 to $2.75 for coremakers. Springfield, Ohio, molders have asked for nine hours and an increase of 25 cents a day over the present basis of $2.65 and $2.90 for bench and floor molders, respectively.

The agreement between foundrymen and molders at Youngstown, Ohio, expires June 30, 1906. The molders have given notice that they desire some changes in wages and conditions, but have not yet gone into details.

At Holyoke, Mass., the union molders have asked for a minimum of $2.75 for molders and coremakers and for a nine-hour day, with overtime and double time provisions.

The union molders of Montreal, Quebec, ask an advance in the minimum for molders and coremakers to $3 and a 20 per cent. advance for all day workers.

At Kansas City and a few other places the Molders' Union has called out the apprentices under assurances of support. This in spite of the fact that the apprentices are serving time under an agreement which they violate in going out.

Status of the Strike Elsewhere.

The foundrymen of Minneapolis and St. Paul are nearly all taking off heats and are increasing their working forces. Buffalo foundrymen are cooperating closely and have announced that they will run open shops hereafter. Several foundries are in operation. At Beloit, Wis., handy men and apprentices are turning out an increasing output and molding machines are being used to a greater extent. The largest firm in the city has melted nearly 100 tons a day in the past week. Toledo, Ohio, foundrymen have passed resolutions refusing to deal with the union and declaring that all who return to work must come as individuals. Conditions are reported unchanged at Nashua, N. H.; Wilmington, Del.; New Orleans, La.; Scranton and Hazelton, Pa.; Grand Rapids, Mich.; Topeka, Kas.; Willoughby, Ohio; Kansas City, Mo.; Troy, Cohoes and Waterford, N. Y. At Boston some of the molders and coremakers, as individuals, have sought interviews with their employers.

The ore carrier Michigan, the first of three steel ships under construction by the Great Lakes Engineering Works for the Cleveland Cliffs Iron Company, was launched May 26, at Detroit. Each of the three steamers will be 550 feet in length, 56 feet beam and 31 feet depth of hold, having a carrying capacity of 10,000 tons.

The Iron and Metal Trades

The widespread struggle between the founders and the molders over the open shop issue is to a considerable extent curtailing the melting of Iron and has led to some holding up of deliveries. The Foundry Iron markets are therefore somewhat weaker. The course of consumers seems to vary in different sections of the country. Thus in the Central West an Ohio maker of Cast Iron Pipe, after getting prices on a round lot of Iron, withdrew after the figures were in without placing the order. In the Philadelphia district another manufacturer of Cast Iron Pipe has already bought close to 10,000 tons and is expected to double the quantity, if prices are right. In the Chicago district two of the largest melters of Iron are still withholding their orders.

The market for steel making irons is very quiet after last week's purchase in the Pittsburgh district of 25,000 tons by one large interest for delivery during the last half, and of 10,000 tons by another large steel company. In the East one structural mill has bought 4000 tons of Basic Pig and another has taken on additional tonnage.

The Steel Rail mills have booked about 20,000 tons more for this year, the largest single item being 9000 tons for the Florida East Coast Road and 3000 tons for the Wabash. For 1907 delivery there have been booked 40,000 tons for the Illinois Central, 25,000 tons for the Chicago, Burlington & Quincy, 27,000 tons for the Tidewater Railway, 20,000 tons additional for the Great Northern, 10,000 tons each for the Wheeling & Lake Erie and the Omaha, 9000 tons for the Northern Electric Street Railway, 4000 tons for the New York, Ontario & Western, and 5000 additional for the Northern Pacific, making the total for the latter now 45,000 tons.

The American Bridge Company has thus far booked this month 60,000 tons of orders, the latest being 28,000 tons for the Hudson Company's tunnel terminal and 10,000 tons for the New Trinity and North Trinity buildings. The Pennsylvania Steel Company has secured the contract for a 4000 ton bridge at Pierre, S. D.

Of interest to the Plate trade is the contract for Riveted Water Pipe for Brooklyn, just secured by the East Jersey Pipe Company. This will require 12,000 tons of ⅝-inch Plates.

In the Sheet trade the steady strengthening of the market is leading to the belief that an advance may be established at no distant date.

The domestic Wire trade is rather quiet, as is usual at this time of the year. It is understood, however, that there is a very satisfactory export movement.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	May29, 1906.	May23, 1906.	May2, 1906.	May 31, 1905.
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia	$18.50	$18.50	$18.50	$17.00
Foundry No. 2, Southern, Cincinnati	16.75	16.75	16.75	15 25
Foundry No. 2, Local, Chicago	*18.50*	18.50	18.75	17.25
Bessemer, Pittsburgh	18.10	18.10	18.10	15.85
Gray Forge, Pittsburgh	*16.35*	16.50	16.60	15.50
Lake Superior Charcoal, Chicago	*19.00*	19 00	19.25	17.50
BILLETS, RAILS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	*25.00*	26.00	27.00	23.00
Forging Billets, Pittsburgh	32.00	32.00	32.00	26.00
Open Hearth Billets, Phila	*28.00*	28.00	29.00	26.50
Wire Rods, Pittsburgh	*34.00*	34.50	34.50	34.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
O. Steel Rails, Chicago	14.00	14.00	14.00	13.00
O. Steel Rails, Philadelphia	*16.25*	16.25	17.25	15.75
O. Iron Rails, Chicago	21.25	21.25	21.25	18.00
O. Iron Rails, Philadelphia	*21.00*	21.00	21.50	20.00
O. Car Wheels, Chicago	19.00	19.00	19.00	14.25
O. Car Wheels, Philadelphia	*16.50*	17.00	16.75	15.50
Heavy Steel Scrap, Pittsburgh	*14.50*	14.50	15.00	14.25
Heavy Steel Scrap, Chicago	**14.00**	14.00	13.50	12.00
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	1.63½	1.63½	1.63½	1.63½
Common Iron Bars, Chicago	1.66½	1.66½	1.66½	1.50
Common Iron Bars, Pittsburgh	1.50	1.50	1.50	1.50
Steel Bars, Tidewater, New York	1.64½	1.64½	1.64½	1.64½
Steel Bars, Pittsburgh	1.50	1.50	1.50	1.50
Tank Plates, Tidewater, New York	1.74½	1.74½	1.74½	1.74½
Tank Plates, Pittsburgh	1.60	1 60	1.60	1.60
Beams, Tidewater, New York	1.84½	1.84½	1.84½	1.74½
Beams, Pittsburgh	1.70	1.70	1.70	1.60
Angles, Tidewater, New York	1.84½	1.84½	1.84½	1.74½
Angles, Pittsburgh	1.70	1.70	1.70	1.60
Skelp, Grooved Steel, Pittsburgh	1.57½	1.57½	1.57½	1.50
Skelp, Sheared Steel, Pittsburgh	1.60	1.60	1.60	1.55
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.25	2.25	2.25	2.20
Wire Nails, Pittsburgh	1.85	1.85	1.85	1.80
Cut Nails, Pittsburgh	1.80	1.80	1.80	1.80
Barb Wire, Galv., Pittsburgh	2.30	2.30	2.30	2.25
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Copper, New York	**18.75**	18.75	18 62½	15.00
Spelter, St. Louis	*5.85*	5.80	5.95	5.10
Lead, New York	**6.00**	6.00	5.60	4.50
Lead, St. Louis	**5.90**	5.90	5.60	4.40
Tin, New York	**41.00**	41.90	40.00	30.05
Antimony, Hallett, New York	**27.00**	27.00	22.00	9.25
Nickel, New York	40.00	40.00	40.00	40.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York	**$3.94**	$3.94	$3.79	$3.74

Chicago.

FISHER BUILDING, May 29, 1906.—(*By Telegraph.*)

The market in both raw and finished materials is comparatively quiet and producers are not looking forward to an extensive buying movement before July. The pressure on the mills for contract material, however, continues unabated and their iron producing capacity is inadequate to steel works requirements. The local mill, which has been depending upon heavy shipments of Bessemer from the valleys, is now endeavoring to purchase iron from Western merchant furnaces, but is meeting with little success, and no tonnage is available at Ohio stacks, as these furnaces are sold up to their capacities for months ahead. This indicates that there is little falling off in consumption, and the attitude of buyers in deferring purchases is largely influenced by their assumptions that prices will not go higher and may decline slightly if they hold off long enough. This attitude is accentuated in the steel bar trade, on account of the concessions made the implement manufacturers, and heavy consumers of foundry iron grades in need of material are buying intermittently, believing that a lower basis will prevail during the summer months. The Massillon Iron & Steel Company has temporarily deferred its purchase of 12,000 tons, on account of the comparatively high basis now being maintained by all Southern operators, and the Allis-Chalmers Company and the International Harvester Company, the largest consumers in the West, are still withholding inquiries. Contracts for bridge material placed during the week include 4000 tons for the Chicago & Northwestern Railroad, placed with the Pennsylvania Steel Company, and 1000 tons for the Great Northern went to the American Bridge Company. The United States Cast Iron Pipe & Foundry Company

was awarded a contract for 3500 tons of cast iron pipe for the city of Chicago, and Winnipeg, Manitoba, closes next week for 2000 tons.

Pig Iron.—The market has settled down to a test of endurance between producers and consumers, and as the latter are covering immediate needs only it is doubtful if a buying movement of any importance will develop during the month of June. The molders' strike has resulted in the cancellation of numerous shipments, but as yet the tonnage is so small that it has had little effect on the situation. Including stocks in warrant yards, it is estimated that Southern furnaces have less than 100,000 tons on hand, and notwithstanding the heavy production, accumulations are showing little increase. Northern furnaces are well sold through July, and an opportunity of turning on Bessemer is offered, on account of the shortage of steel making grades. Numerous malleable foundries that a month ago made inquiries have not yet closed, and the stand taken by other large consumers would indicate that purchases for some time will be limited to small lots. There has been no weakening of prices, and the agreement of Southern producers is being well maintained. Prevailing quotations, f.o.b. Chicago, are as follows:

Lake Superior Charcoal	$19.00 to $19.50
Northern Coke Foundry, No. 1	19.00 to 19.50
Northern Coke Foundry, No. 2	18.50 to 18.75
Northern Coke Foundry, No. 3	18.00 to 18.25
Northern Scotch, No. 1	19.50 to 19.75
Ohio Strong Softeners, No. 1	18.55 to 18.80
Ohio Strong Softeners, No. 2	18.05 to 18.30
Southern Coke, No. 1	18.25 to 18.40
Southern Coke, No. 2	17.65 to 17.90
Southern Coke, No. 3	17.15 to 17.40
Southern Coke, No. 4	16.65 to 16.90
Southern Coke, No 1 Soft	18.15 to 18.40
Southern Coke, No. 2 Soft	17.65 to 17.90
Southern Gray Forge and Mottled	16.15 to 16.40
Malleable Bessemer	18.30 to 18.55
Standard Bessemer	19.30 to 19.55
Jackson Co. and Kentucky Silvery, 6 %	20.30 to 20.80
Jackson Co. and Kentucky Silvery, 8 %	21.30 to 21.80
Jackson Co. and Kentucky Silvery, 10 %	23.30 to 23.80

Billets and Rods.—There has been a fair movement of Forging Billets, and carload lots are now selling on a basis of $33.50 to $34, f.o.b. Chicago, representing a slight decline over previous prices. Bessemer and Open Hearth Rods are in little demand, and are held at $34.50 to $35.

Rails and Track Supplies.—The buying movement of Standard Sections for next year's delivery is practically at an end for the present at least, all of the large Western roads having covered their requirements. For this year's delivery one road is in the market for 8000 tons, but as yet the order has not been closed. Light Rails continue in heavy demand at unchanged prices. We quote as follows: Angle Bars, accompanying Rail orders, 1906 delivery, 1.50c.; carload lots, 1.75c.; Spikes, 2.25c. to 2.35c.; Track Bolts, 2.65c. to 2.75c., base, Square Nuts, and 2.80c. to 2.90c., base, Hexagon Nuts. The store prices on Track Supplies range from 15c. to 20c. above mill prices. Light Rails, 30 to 45 lb. sections, $27 to $28; 25-lb. $29; 20-lb., $29 to $30; 16-lb., $30 to $31; 12-lb., $31 to $32, and lighter sections down to 8-lb., $38 to $40, f.o.b. mill. Standard Sections are unchanged at $28, f.o.b. mill, full freight to destination.

Structural Material.—The Pennsylvania Steel Company was awarded the contract for the erection of a bridge over the Missouri River at Pierre, S. D., by the Chicago & Northwestern Railroad. About 4000 tons of material will be required. The Great Northern awarded a contract for 1000 tons of Structural Steel for bridge work to the American Bridge Company. While numerous projects are being figured upon locally, no contracts of note have been placed during the week. The larger possibilities that architects are now working on include the following: Hotel at La Salle and Madison streets, for Jos. Biefeld; Commercial Building at Michigan Boulevard and Harrison street, for Mrs. Julia F. Heyworth; commercial building at 206 State street; commercial building at Michigan Boulevard and Hubbard court, for Otto Young; bank and office building at Kansas City, Mo., for National Bank of Commerce; theatre and office building at Kansas City, for L. N. Leslie. Quotations are as follows: Beams and Channels, 3 to 15 inches, inclusive, 1.86½c.; Angles, 3 to 6 inches, ¼-inch and heavier, 1.86½c.; larger than 6 inches on one or both legs, 1.96½c.; Beams, larger than 15 inches, 1.96½c.; Zees, 3 inches and over, 1.86½c.; Tees, 3 inches and over, 1.91½c., in addition to the usual extras for cutting to extra lengths, punching, coping, bending or other shop work.

Plates.—So far as new requirements are concerned the market continues exceedingly quiet, although specifications are fair and are on a par with mill capacity. Numerous car orders are in the market, indicating that the railroads are early contemplating rolling stock purchases for 1907. Quotations are as follows: Tank quality, ¼-inch and heavier, wider than 6¼ and up to 100 inches wide, inclusive, car lots, Chicago, 1.76½c.; 3-16 inch, 1.86½c.; Nos. 7 and 8 gauge, 1.91½c.; No. 9, 2.01½c.; Flange quality, in widths up to 100 inches, 1.86½c., base, for ¼-inch and heavier, with the same advances for lighter weights; Sketch Plates, Tank quality, 1.86½c.; Flange quality, 1.96½c. Store prices on Plates are as follows: Tank Plate, ¼-inch and heavier, up to 72 inches wide, 2c. to 2.10c.; from 72 to 96 inches wide, 2.10c. to 2.20c.; 3-16 inch up to 60 inches wide, 2.10c. to 2.20c.; 72 inches wide, 2.35c. to 2.45c.; No. 8, up to 60 inches wide, 2.15c. to 2.25c.; Flange and Head quality, 25c. extra.

Sheets.—The continued strength shown by Black and Galvanized Sheets is somewhat surprising to the trade, inasmuch as a lull is usually expected during the closing weeks of May. The demand continues so heavy that the mills are unable to promise deliveries on the lighter gauges in less than 30 days, and on some of the heavier gauges 60 days is required. Quotations are as follows: Blue Annealed, Nos. 9 and 10, 1.86½c. to 1.91½c.; Nos. 16 and 17, 2.06½c. to 2.11½c.; Box Annealed, Nos. 18 to 20, 2.26½c. to 2.31½c.; No. 27, 2.46½c. to 2.51½c.; No. 28, 2.56½c. to 2.61½c.; Galvanized Sheets, Nos. 10 to 14, 2.61½c.; Nos. 17 to 21, 2.86½c.; Nos. 22 to 24, 3.01½c.; Nos. 25 and 26, 3.21½c.; No. 27, 3.41½c.; No. 28, 3.61½c.; No. 30, 4.11½c. Sheets from store: Blue Annealed, Nos. 10 and 11, 2.10c. to 2.20c.; Nos. 12 and 13, 2.15c. to 2.25c.; Nos. 14 and 15, 2.20c. to 2.30c.; No. 16, 2.30c. to 2.40c. Box Annealed: Nos. 18 to 20, 2.50c. to 2.55c.; Nos. 22 to 24, 2.55c. to 2.60c.; No. 26, 2.60c. to 2.65c.; No. 27, 2.65c. to 2.70c.; No. 28, 2.75c. to 2.80c.; No. 30, 3.15c. to 3.20c. Galvanized, from store: Nos. 10 to 20, 3c. to 3.05c.; Nos. 22 to 24, 3.15c. to 3.20c.; No. 26, 3.35c. to 3.40c.; No. 27, 3.55c. to 3.60c.; No. 28, 3.75c. to 3.80c.; No. 30, 4.95c. to 5c.

Bars.—Steel Bar consumers outside of the implement trade persistently refuse to contract with the mills for their future requirements on the existing basis, and the Steel producers, on the other hand, just as insistently refuse to make any concession. Specifications, however, are coming forward freely, and, while the mills are making earlier deliveries, there is no dearth of tonnage. Iron Bar manufacturers are firmly maintaining agreed prices, although new tonnage is comparatively light and is limited almost entirely to small lots. We quote as follows: Iron Bars, 1.66½c.; Steel Bars, 1.66½c., both half extras; Hoops, 2.06½c., extras as per Hoop card; Bands, 1.66½c., as per Steel card; Soft Steel Angles and Shapes, 1.66½c., half extras. Store prices are as follows: Bar Iron, 2.10c.; Steel Bars, 1.85c., and as high as 2c. is asked on certain scarce sizes; Steel Bands, 1.85c. to 1.90c., half extras; Soft Steel Hoops, 2.30c. to 2.40c., full extras.

Merchant Pipe.—Jobbers' stocks are being heavily drawn upon by the building trade, and a replenishing buying movement is anticipated during the month of June. Quotations continue practically unchanged on the basis of 81 per cent. off the list, Pittsburgh, but official discounts on car lots, Chicago, are as follows: Black Steel Pipe, 78.35 per cent. on the base sizes, ¾ to 6 inches, and Galvanized, 68.35 per cent. Iron Pipe is quoted from 1½ to 2 points higher. From store in small lots Chicago jobbers are quoting 76½ to 77 per cent. on Black Steel Pipe, ¾ to 6 inches.

Boiler Tubes.—Notwithstanding the large orders that have recently been placed with the mills the low prices named during the last week in April have not yet been withdrawn. Specifications are fair, although early deliveries can be made by practically all the mills. Discounts on base sizes, 2¾ to 5 inches, in car lots, are as follows: Steel Tubes, 68.35; Iron, 55.35; Seamless, 50.35; 2½-inch and smaller and lengths over 18 feet, and 2½-inch and lengths over 22 feet, 10 per cent. extra. Store prices are unchanged, as follows:

	Steel.	Iron.	Seamless.
1 to 1½ inches	40	35	42½
1¾ to 2¼ inches	50	35	35
2½ inches	52½	35	30
2¾ to 5 inches	60	47½	42½
6 inches and larger	50	35	..

Cast Iron Pipe.—The city of Chicago purchased 3500 tons from the United States Cast Iron Pipe & Foundry Company last week. The city of Winnipeg, Canada, closes June 4 for approximately 2000 tons of varied sizes. All of the Pipe shops are sold well through the summer, and none is in position to promise deliveries in less than 30 days. Quotations continue to be maintained on the following basis: Water Pipe, 4-inch, $31; 6, 8, 10 and 12 inch, $30; over 12-inch $29, with $1 extra for Gas Pipe. Large municipal contracts are usually placed at somewhat lower basis.

Merchant Steel.—A few belated contracts continue to be received from implement manufacturers for their year's requirements, dating from July 1. These include special shapes of all kinds, as well as Shafting and high grade Steels. Quotations are as follows: Planished or Smooth Finished Tire Steel, 1.86½c.; Iron Finish, up to 1½ x ½ inch, 1.81½c.; Iron Finish, 1½ x ½ inch and larger, 1.66½c., base; Channels for solid rubber tires, ¾ to 1 inch, 2.16½c., and 1⅛ inch and larger, 2.06½c.; Smooth Finished Machinery Steel, 1.91½c.; Flat Sleigh Shoe, 1.71½c.; Concave and Convex Sleigh Shoe, 1.96½c.; Cutter Shoe, 2.35c.; Toe Calk Steel, 2.21½c.; Railway Spring, 1.86½c.; Crucible Tool Steel, 6½c. to 8c., and still higher prices are asked on special grades. Shafting, 50 per cent. off on car lots and 45 per cent. in less than car lots, in base territory.

Coke.—The heavy demand for Furnace Coke to some extent has strengthened the situation in Foundry grades, and while occasionally low prices continue to be made on consignments, both from the Connellsville and Virginia fields, higher prices prevail on contract deliveries. High grade Connellsville Coke is held on the basis of $3 at the ovens, equivalent to $5.65, Chicago, although concessions of 25 cents a ton are made by consignment shippers. Wise County Coke is quoted at $5 to $5.25, and By-Product Coke is quoted at $5.65 on contract and $5.80 in car lots for prompt delivery.

Old Material.—Dealers continue to absorb railroad offerings at higher prices than consumers are willing to pay and they have taken this position on account of their unbounded faith in future conditions and accompanying higher values. During the past week the railroads disposed of over 5000 tons of material, including 2000 by the Chicago, Burlington & Quincy and 3500 tons by the Illinois Central. The range of prices paid by large consumers to producers and dealers, per gross ton, car lots, f.o.b. Chicago, is as follows:

Old Iron Rails	$21.25 to $21.50
Old Steel Rails, 4 feet and over	16.00 to 16.50
Old Steel Rails, less than 4 feet	14.00 to 14.50
Heavy Relaying Rails, subject to inspection, 50 pounds and under	27.00 to 27.50
Old Car Wheels	19.00 to 19.50
Heavy Melting Steel Scrap	14.00 to 14.50
Frogs, Switches and Guards	14.00 to 14.50
Mixed Steel	12.00 to 12.50

The following quotations are per net ton:

Iron Fish Plates	$16.50 to $17.00
Iron Car Axles	23.00 to 23.50
Steel Car Axles	18.00 to 18.50
No. 1 Railroad Wrought	14.50 to 15.00
No. 2 Railroad Wrought	13.50 to 14.00
Railway Springs	13.50 to 14.00
Locomotive Tires, smooth	14.00 to 14.50
No. 1 Dealers' Forge	12.00 to 12.50
Mixed Busheling	10.25 to 10.50
Iron Axle Turnings	10.25 to 11.00
Soft Steel Axle Turnings	10.00 to 10.50
Machine Shop Turnings	10.00 to 10.50
Cast Borings	8.75 to 9.00
Mixed Borings, &c	8.75 to 9.00
No. 1 Mill	9.00 to 9.25
No. 2 Mill	8.00 to 8.25
No. 1 Boilers, cut to Sheets and Rings	9.50 to 10.00
No. 1 Cast Scrap	13.50 to 14.00
Stove Plate and Light Cast Scrap	11.00 to 11.50
Railroad Malleable	13.50 to 14.00
Agricultural Malleable	12.50 to 13.00

Metals.—Another break, though slight, is noted on Pig Tin. Although there is considerable fluctuation in prices as a result of speculation, the market holds decidedly firm. There is an absence of demand in Spelter in this territory and prices are slightly lower. The demand for Copper is not heavy, but the fact that available supplies are pretty well spoken for gives a firm tone to this market. We quote: Casting Copper, 18¾c. to 18⅞c.; Lake, 18⅞c. to 19¼c., in car lots; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 42¼c. to 42⅜c.; small lots, 43¼c. to 43½c.; Spelter, prompt delivery, 6.15c. to 6.25c., for car lots; Lead, Desilverized, 6.15c. to 6.25c., for 50-ton lots; Corroding, 6.65c. to 6.75c., for 50-ton lots; on car lots, 2½c. per 100 lbs. higher; Cookson's Antimony, 33c., and other grades, 30c. to 31c.; Sheet Zinc is $7.65 list, f.o.b. Lasalle, in car lots of 60-lb. casks. On Old Metals we quote: Copper Wire, 16¾c.; Heavy Copper, 16¼c.; Copper Bottoms, 15½c.; Copper Clips, 15¾c.; Red Brass, 15½c.; Red Brass Borings, 13¾c.; Yellow Brass, 12¼c.; Yellow Brass Borings, 10¼c.; Light Brass, 8¾c.; Lead Pipe, 4¾c.; Tea Lead, 4½c.; Zinc, 4½c.; Pewter, No. 1, 24c.; Tin Foil, 32c.; Block Tin Pipe, 27½c.

Birmingham.

BIRMINGHAM, ALA., May 28, 1906.

Pig Iron.—The Iron market continues very much the same as it has been for the past several weeks. One of the largest producers in the district reports more activity, but others state that their business has consisted only of the hand to mouth buying which has been in evidence for some time. The price, however, seems to be as firmly fixed at $14 for No. 2 Foundry as heretofore, and unless some unforseen condition arises there is very little probability of a change in the near future. Shipments are moving with their accustomed regularity, and no stocks are accumulating. Many requests from melters booked only for their requirements for the first half of the year are being received to anticipate shipment, and it is a foregone conclusion that the long predicted buying movement is close at hand.

The No. 2 City Furnace of the Sloss-Sheffield Steel & Iron Company, which has been out of blast since last December undergoing relining and general repairs, will be blown in June 15.

Cast Iron Pipe.—Some idea of the enormous demand for Cast Iron Pipe may be gained from the announcement of a newly erected foundry here, which has only been soliciting business for the past 30 days, that it is now turning down orders on account of inability to make deliveries, its output having already been booked for several months. On account of the unprecedented demand prices on Water Pipe have been somewhat advanced, and are now on approximately the following basis: 4 to 6 inch, $27 to $27.50; 8 to 12 inch, $26.50 to $27; over 12-inch, $25. Gas Pipe $1 per ton extra.

Old Material.—The market continues inactive, with a tendency toward slightly lower prices. The dull season in the Scrap market is now approaching, and very little improvement can be expected for the next two or three months. Dealers are quoting approximately as follows per gross ton, f.o.b. cars here:

Old Iron Rails	$19.00 to $19.50
Old Iron Axles	18.50 to 19.00
Old Steel Axles	16.00 to 17.00
Old Car Wheels	17.00 to 17.50
No. 1 Railroad Wrought	16.00 to 16.50
No. 2 Railroad Wrought	15.00 to 15.50
No. 1 Country Wrought	13.75 to 14.25
No. 2 Country Wrought	11.75 to 12.25
Wrought Pipe and Flues	11.75 to 12.25
Railroad Malleable	12.00 to 12.50
No. 1 Steel	12.00 to 12.50
No. 1 Machinery Cast	11.00 to 11.50
Stove Plate and Light Cast	9.00 to 9.50

The Birmingham Iron Company, which was recently organized with Morris Adler, president, and Edgar Adler, general manager, will on June 1 take charge of what has heretofore been operated as the Tutwiler Coal, Coke & Iron Company. The Adler brothers recently bought E. M. Tutwiler's interest in the Tutwiler Company and now own the entire stock. The furnace at Boyles is to be blown out June 1 for general repairs and will be equipped with skip hoist and other improvements and its daily capacity increased to 150 tons. Plans for the new furnace are now being drawn and construction work will begin in the near future. It is to be a 225-ton stack and modern in every respect. The mines of the company are to be equipped with an electric haulage system and their output sufficiently increased to supply the new furnace.

A decision of more than usual interest to the iron producers of this district was rendered in the city court here this week. The second damage suit against the Alabama Steel & Wire Company, now the Southern Steel Company, for loss of life in the Virginia mine explosion, which has been on trial for the past two weeks, resulted in a verdict for the defendant, as did the first case. It will be remembered that in this explosion, which occurred in February, 1905, 111 lives were lost, and suits for damages aggregating nearly $3,500,000 were filed. While it is generally conceded that the accident was caused by a "windy shot" setting off an accumulation of coal dust, the defendant showed that the proper method of keeping the mine clean had been pursued and the ventilation and construction of the mine were according to the most approved design.

Cincinnati.

FIFTH AND MAIN STS., May 29, 1906.—(*By Telegraph.*)

Pig Iron.—The market remains quiet. Buyers are showing but slight interest in forward deliveries, the little business done being mostly for prompt shipment. The inquiry reported last week for 12,000 tons from a central Ohio Pipe shop resulted in the buyer deciding to hold off for the present. It is said that the buyer was disappointed in the prices quoted, although some Iron was offered at less than current quotations. There is a fair inquiry for Malleable Iron, which is steady at $16 at southern Ohio furnace. It is stated that a large Ohio melter is in the market, but the amount of tonnage is not given. An Indiana foundry asks for prices on 1000 tons of Northern and 500 tons of Southern for delivery in the next two months. In spite of the long continued dullness furnace interests are trying hard to hold present quotations. This is particularly noticeable in the South, although we hear of an occasional $13.50 price coming out. Selling agencies appear to be less confident of an early buying movement, as buyers in a general way have shown much less interest in the market in the past two weeks. Freight rates from the Hanging Rock district are $1.15 and from Birmingham $3. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1	$17.25 to $17.50
Southern Coke, No. 2	16.75 to 17.00
Southern Coke, No. 3	16.25 to 16.50
Southern Coke, No. 4	15.75 to 16.00
Southern Coke, No. 1 Soft	17.25 to 17.50
Southern Coke, No. 2 Soft	16.75 to 17.00
Southern Coke, Gray Forge	15.00 to 15.25
Southern Coke, Mottled	14.50 to 14.75
Ohio Silvery, No. 1 (8 per cent. Silicon)	21.65 to 22.15
Lake Superior Coke, No. 1	17.65 to 18.15
Lake Superior Coke, No. 2	17.15 to 17.65
Lake Superior Coke, No. 3	16.65 to 17.15
Car Wheel Irons.	
Standard Southern Car Wheel	$23.50 to $24.00
Lake Superior Car Wheel	22.00 to 22.50

Coke.—There is a little more interest in the market and some contracting of Foundry Coke. We quote best brands of Connellsville and Virginia Foundry $2.75 to $3, f.o.b. ovens.

Finished Iron and Steel.—Bar Iron is dull, but quotations generally are uniform. The jobbing demand for Structural Shapes is good. We quote, f.o.b. Cincinnati, as

follows: Iron Bars, in carload lots, 1.63c., with half extras; the same, in smaller lots, 2c., with full extras; Steel Bars, in carload lots, 1.63c., with half extras; the same, in small lots, 1.85c., with full extras; Base Angles, 1.83c., in carload lots; Beams and Channels, in carload lots, 1.83c.; Plates, ¼-inch and heavier, 1.73c., in carload lots; in smaller lots, 1.90c.; Sheets, 16 gauge, in carload lots, 2.15c.; in smaller lots, 2.70c.; 14 gauge, in carload lots, 2.05c.; in small lots, 2.60c.; Steel Tire, 1 x ¼ inch or heavier, 1.83c., in carload lots.

Old Material.—There is a firm undertone to the market. But few railroad lists are coming out, and these are quickly withdrawn unless prices are satisfactory. We quote dealers' prices, f.o.b. Cincinnati, as follows: No. 1 Railroad Wrought Scrap, $15 to $15.50 per net ton; Cast Borings, $5 to $6 per net ton; Steel Turnings, $8 to $9 per net ton; No. 1 Cast Scrap, $12 to $13 per net ton; Iron Rails, $21 to $22 per gross ton; Steel Rails, rolling mill lengths, $15 to $16 per gross ton; Relaying Rails, 56 lbs. and upward, $28 to $29 per gross ton; Iron Axles, $22 to $23 per net ton; Car Wheels, $17.50 to $18.50 per gross ton; Low Phosphorus Scrap, $18 to $19 per gross ton.

Pittsburgh.

PARK BUILDING, May 29, 1906.—(*By Telegraph.*)

Pig Iron.—The Pig Iron market has been very quiet the past week, but little tonnage having been sold. There is practically no Bessemer or Basic Iron to be had for delivery in June, but the large consumers are pretty well covered. We quote Bessemer Iron at $17.25 and Basic at $17, Valley furnace, the market being very firm at these prices. There is not much inquiry for Foundry Iron and prices are rather weak. We quote Northern No. 2 Foundry at $16 to $16.50, Valley furnace. Forge Iron is also quiet and we quote Northern brands at $15.50, Valley furnace, or $16.35, Pittsburgh.

Steel.—The supply of Bessemer and Open Hearth Billets is larger and the mills are making better deliveries on contracts. The scarcity in Sheet and Tin Bars still continues, deliveries to consumers being very unsatisfactory, and the supply does not promise to be increased before August or September. By that time one or two new producers will be in the market. We quote Bessemer Billets at $26 and Open Hearth Billets at $27, Pittsburgh. Sheet and Tin Bars in random lengths are $28, Pittsburgh, with an advance of 50c. a ton for Cut Bars.

(*By Mail.*)

A good deal of inquiry is reported for both Bessemer and Basic Iron, with little to be had for delivery prior to July 1, and with not much being offered for July delivery. The shortage in supply of Basic Iron has been aggravated by the closing down for ten days or two weeks of the Struthers Furnace, which runs exclusively on Basic. It is also likely that Canal Dover Furnace, which runs on Basic, will close down in a short time for repairs, as the furnace is working badly. The purchase of 25,000 tons of Bessemer Iron by the Jones & Laughlin Steel Company and 10,000 tons by the Republic Iron & Steel Company takes these two concerns out of the market as buyers, for a time at least. Basic Iron for early delivery is very firm at $17 and Bessemer at $17.25 at Valley furnace for early delivery. The Massillon Iron & Steel Company, at Massillon, Ohio, maker of Cast Iron Pipe, has been inquiring for upward of 35,000 tons of Foundry Iron, but after getting prices from a number of furnaces and sizing up the general situation it has decided not to buy for the present. The Foundry Iron market is rather weak, with not much inquiry, and some sellers are quoting at low as $16 at furnace, while small lots are selling at $16.25 to $16.40. There is not much inquiry for Forge Iron and prices are weaker, Northern brands being offered as low as $15.50 at furnace or $16.35, Pittsburgh. Bessemer Billets are being rather freely offered at $26 and Open Hearth at $27 by mills outside the Pittsburgh district. The scarcity in supply of Sheet and Tin Bars is as great as ever and does not promise to be relieved for some time. A moderate amount of tonnage is being placed in Finished Material, but it is not as heavy as some time ago. The reports of an advance in prices of Merchant Pipe and Sheets, to become effective June 1, are officially denied. Scrap and Coke continue very dull and prices are weak.

Ferromanganese.—A good deal of Ferro is being offered in small lots for spot shipment, but there is no inquiry. We quote foreign 80 per cent. for June and July delivery at $80, Pittsburgh. If any considerable tonnage were offered it is likely this price would be shaded. For extended delivery we quote 80 per cent. at $75, Pittsburgh, but this price would also likely be shaded on large tonnage.

Muck Bar.—The market is very quiet, and we quote best grades made from all Pig Iron at nominally $28, Pittsburgh.

Steel Rails.—New business has been rather light the past week, the only large contract placed with the Carnegie Steel Company being one from the Northern Electric Railway, a suburban line in California, for 20,000 tons, of which 14,000 tons are for this year and 6000 tons for 1907. This buyer early in the year placed a contract with the Carnegie Company for 11,000 tons, but the contract was burned up in the San Francisco fire and a new one has been made for the above tonnage. We quote Standard Sections at $28 at mill. We quote Light Rails as follows: 8-lb., $36; 10-lb., $32; 12-lb., $30; 16-lb., $29; 20-lb., $28.50; 25 to 45 lbs., $27.50 to $28, maker's mill.

Rods.—We note a sale of 100 tons of Bessemer Rods at $34, Pittsburgh. The report that the American Steel & Wire Company had sold 5000 tons of Bessemer Rods at $32, Pittsburgh, is denied. We quote Bessemer and Open Hearth Rods at $34 to $34.50 and Chain Rods at $35, Pittsburgh.

Skelp.—Not much new tonnage is offering, but prices are fairly steady. Grooved Steel Skelp, 1.57½c. to 1.60c.; Sheared Steel Skelp, 1.60c. to 1.65c.; Grooved Iron Skelp, 1.65c. to 1.70c.; Sheared Iron Skelp, 1.75c. to 1.80c., Pittsburgh, these prices being for ordinary widths and gauges.

Structural Material.—The Toledo Building at Toledo, Ohio, about 1200 tons, was to have been placed last week, but has been postponed for a week or ten days. The National Iron & Wire Works at Cleveland has taken the Murphy Building and a Steel frame building for the Champion Rivet Company, about 800 tons in both jobs. A number of the smaller outside Structural concerns are naming relatively low prices on small work that is coming up and this is disturbing stability in the general market to some extent. Deliveries of material by the mills are better than for some time. We quote: Beams and Channels, up to 15-inch, 1.70c.; over 15-inch, 1.80c.; Angles, 3 x 2 x ¼ inch thick up to 6 x 6 inches, 1.75c.; 8 x 8 and 7 x 3½ inches, 1.80c.; Zees, 3-inch and larger, 1.70c.; Tees, 3-inch and larger, 1.75c. Under the Steel Bar card Angles, Channels and Tees under 3-inch are 1.60c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Plates.—Some car orders are coming up, requiring considerable tonnage in Plates, but on Sheared sizes the demand continues very light. For Universal Plates a good deal of business is being placed and the mills are behind in deliveries. Official prices, which still continue to be shaded from $1 to $2 a ton in some cases, are as follows: Tank Plates, ¼-inch thick, 6¼ up to 100 inches in width, 1.60c., base, at mills, Pittsburgh. Extras over the above prices are as follows:

	Extra per 100 pounds.
Gauges lighter than ¼-inch to and including 3-16-inch Plates on thin edge	$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 inches	.05
Plates over 110 to 115 inches	.10
Plates over 115 to 120 inches	.15
Plates over 120 to 125 inches	.25
Plates over 125 to 130 inches	.50
Plates over 130 inches	1.00
All sketches (excepting straight taper Plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Fire Box Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40

Shell Grade of Steel is abandoned.

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within ten days from date thereof, discount of ⅓ of 1 per cent. is allowable. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 inches wide down to 6 inches of Tank, Ship or Bridge quality.

Sheets.—The trade is anticipating to some extent an early advance in prices of Sheets and for this reason is placing orders more liberally than for some time. The smaller trade is contracting ahead for its requirements for the entire year, believing that any change in prices will surely mean an advance. The leading mills are filled with tonnage for some time ahead and are somewhat behind in deliveries. A good deal of Roofing Material and Siding is being shipped to San Francisco to cover new buildings. Prices are quite firm and we quote: Black Sheets, Box Annealed, one pass through cold rolls, Nos. 10 to 12 gauge, 1.95c. to 2c.; Nos. 13 and 14, 2c. to 2.05c.; Nos. 15 and 16, 2.05c. to 2.10c.; Nos. 17 to 21, 2.10c. to 2.15c.; Nos. 22 to 24, 2.15c. to 2.20c.; Nos. 25 and 26, 2.20c. to 2.25c.; No. 27, 2.25c. to 2.30c.; No. 28, 2.35c. to 2.40c.; No. 29, 2.50c. to 2.55c., and No. 30, 2.60c. to 2.65c. We quote Galvanized Sheets as follows: Nos. 10 and 11, 2.30c. to 2.35c.; Nos. 12 to 14, 2.40c. to 2.45c.; Nos. 15 and 16, 2.50c. to 2.55c.; Nos. 17 to 21, 2.65c. to 2.70c.; Nos. 22 to 24, 2.80c. to 2.85c.; Nos. 25 and 26, 3c. to 3.05c.; No. 27, 3.20c. to

3.25c.; No. 28, 3.40c. to 3.45c.; No. 29, 3.65c. to 3.70c., and No. 30, 3.90c. to 3.95c. We quote No. 28 Gauge Painted Roofing Sheets at $1.60 to $1.65 per square, and Galvanized Roofing Sheets, No. 28 Gauge, at $2.95 to $3 per square for 2-inch corrugations. These prices are for carload lots, jobbers charging the usual advances for small lots from store.

Bars.—New demand for both Iron and Steel Bars is rather light, but specifications on contracts continue to come in quite freely. It is confidently believed that the demand for Iron and Steel Bars will show early improvement. The mills still have a good deal of tonnage on their books, but shipments have been in excess of new orders for some time. We quote Iron and Steel Bars at 1.50c., base, half extras, for carloads and larger lots, f.o.b. Pittsburgh.

Hoops and Bands.—A fair amount of new business is being placed, while specifications on old contracts are quite heavy. We quote Steel Hoops at 1.90c., and Bands for all purposes at 1.50c., base, half extras, as per Standard Steel card. These prices are for carload lots, f.o.b. Pittsburgh, plus full tariff rail rate to point of delivery, an advance of $2 a ton being charged for less than carloads.

Cotton Ties.—The season is over and the mills are now filling contracts placed some time ago at 85c. per bundle, which was the official price.

Tin Plate.—The large business for this year's delivery was placed some time ago and is not affected by the recent advance of 15c. per box in prices. In fact, the amount of new orders being placed for Tin Plate is relatively small, as leading consumers are covered by old contracts. The mills have a great deal of tonnage on their books, some concerns being practically sold up to October or longer. We quote Tin Plate at $3.75 per base box, f.o.b. Pittsburgh, for 14 x 20 100-lb. Cokes, terms 30 days, less 2 per cent. off for cash in ten days, on which price a rebate of 5c. a box is allowed for carloads and larger lots.

Merchant Steel.—It is now stated that the prices on Shafting, which were being materially shaded, are once more on a firm basis. Specifications on old contracts from the implement makers are about over and are not yet being received on new contracts dated from July 1. Only a small amount of new tonnage is being placed. Prices are fairly firm, as follows: Planished or Smooth Finished Tire Steel, 1.70c.; Iron Finish up to 1½ x ½ inch, 1.65c., and Iron Finish, 1½ x ½ inch and larger, 1.50c., base, Pittsburgh, and Channels for solid rubber tire are quoted as follows: ¾, ⅞ and 1 inch, 2c., and 1⅛-inch and larger, 1.90c.; Toe Calk Steel, 2c. to 2.05c.; Railway Spring Steel, 1.75c. to 1.80c.; Cutter Shoes, 2.20c. to 2.25c.; Flat Sleigh Shoe, 1.50c. to 1.55c.; Crucible Tool Steel, 6c. to 8c. for ordinary grades and 12c. and upward for special grades. We quote Cold Rolled Shafting at 50 per cent. discount in carloads and 45 per cent. in less than carloads, delivered in base territory.

Railroad Spikes.—The demand continues very heavy and the mills are behind in deliveries. Prices are firm, and we quote standard sizes of Railroad Spikes at $2 and $2.05 per 100 lbs., f.o.b. Pittsburgh, the lower price being absolutely minimum.

Spelter.—The demand is very dull, and prices are weak. We quote prime grades of Western Spelter at 5.75c. St. Louis, equal to 5.77½c., Pittsburgh.

Merchant Pipe.—The Eastern Oil Company, Buffalo, N. Y., expects to place contracts Tuesday for 65 miles of 12-inch and 40 miles of 10-inch Line Pipe for extension of its gas line to Cumberland, Md. These are very desirable sizes, and it is understood that some relatively low prices have been made by the mills on the inquiry. Reports that the leading interest would announce an advance in prices on Merchant Pipe on June 1 are not confirmed, and it is not believed that any advance will be made. The National Tube Company is furnishing to the Philadelphia Company a heavy tonnage of large sizes of Line Pipe for its city trade. The general demand for Pipe is very active, and the mills are filled up with tonnage for several months ahead, while on the larger sizes of Line Pipe some mills are filled to October or longer. Prices show no betterment, the extreme discount on Merchant sizes of Steel Pipe remaining at 81 and 5 per cent. off to the large trade. Official discounts for carloads, which continue to be shaded one point or more, are as follows:

Merchant Pipe.

	Jobbers, carloads.			
	Steel.		Iron.	
	Black.	Galv.	Black.	Galv.
	%	%	%	%
⅛ and ¼ inch	72	56	69	53
⅜ inch	74	60	71	57
½ inch	76	64	73	61
¾ to 6 inches	80	70	77½	67½
7 to 12 inches	75	60	72½	57
Extra strong, plain ends:				
⅛ to ⅜ inch	65	53	62	50
½ to 4 inches	72	60	69	57
4½ to 8 inches	68	56	65	53
Double extra strong, plain ends:				
⅛ to 8 inches	61	50	58	47

Boiler Tubes.—The low prices ruling on Merchant Tubes have brought out a heavy tonnage and the mills are entering more business than for some time. Locomotive Tubes continue very active and prices are being firmly held. Discounts given below are shaded four points, or $8 a ton, on Merchant Tubes, but are being firmly held, we are advised, on Locomotive Tubes We quote:

Boiler Tubes.

	Iron.	Steel.
1 to 1½ inches	41	46
1¾ to 2¼ inches	41	58
2½ inches	46	60
2¾ to 5 inches	53	66
6 to 13 inches	41	58

Iron and Steel Scrap.—The Scrap trade continues very dull and prices are weak. Dealers quote as follows: Heavy Melting Scrap, $14.50; Bundled Sheet Scrap, $13.75 to $14; Machinery Cast Scrap, $15; No. 1 Wrought Scrap, $16.50 to $16.75; Old Steel Rails, $15; Old Steel Rails, long pieces for rerolling, $15.50; Old Car Wheels, $17.25 to $17.50; Stove Plate, $11 to $11.25; Old Iron Axles, $24 to $24.50; Old Steel Axles, $20 to $20.50; Axle Turnings, $13.50 to $13.75; Cast Iron Borings, $8; Wrought Turnings, $12, all in gross tons, f.o.b. Pittsburgh. If any considerable tonnage were offering it is very probable that the above prices would be shaded.

Coke.—New demand for Coke continues quiet and prices are weak. We quote best grades of Connellsville Furnace Coke at $2.30 to $2.35, and 72-hour Connellsville Foundry Coke at $2.65 to $2.75 a ton at oven. The output of Coke continues heavy, the Upper and Lower Connellsville regions having made last week a little over 375,000 tons.

Philadelphia.

REAL ESTATE TRUST BUILDING, May 28, 1906.

The Iron and Steel markets have changed very little during the past three or four weeks, but there is a want of uniformity which is rather confusing and checks what might otherwise be a somewhat active market. The situation is remarkably strong considering the experiences of the past three or four months, and it may yet be that the irregularity of the present may give place to great activity in the not distant future. The financial cloud which looked somewhat threatening until recently is now regarded as entirely removed, so that normal conditions are expected to prevail during the remainder of the year. After so many jolts as have been experienced from strikes, earthquakes and other unsettling influences, it is hardly to be supposed that anything akin to a boom will be encouraged, but apart from that there are substantial reasons for believing that the last half of the year will bring with it at least a fair average of what was experienced during 1905 and to date in 1906. The crops are not yet made, but reports are favorable, and a good deal will probably depend upon what they may yield. Most of our wealth comes out of the ground, so that it makes scores of millions of dollars of difference whether the crops are good, bad or indifferent. Taking everything into account, however, and in spite of irregularities, confidence is very much stronger than it was several weeks ago, and while there is a disposition to operate conservatively, there is for the present plenty of business to keep consumers actively employed. Nevertheless, developments from week to week will be carefully watched, and if favorable will do much toward strengthening the market, or the reverse in case of anything of an adverse character.

Pig Iron.—Without being in any degree exceptionally buoyant, there is a ready market for almost anything and for any delivery. It seldom happens that some grade of Iron is not neglected, even when standard grades are scarce and advancing, but at the present time, from the most ordinary kind of stuff to the highest qualities, there is a ready market at prices in fair proportion. In saying this it is not to be understood that there is a scramble for material. On the contrary, while there is some scarcity for June and July deliveries, the offerings for the later months are about normal. Consumers can get what they want at quoted rates, which, while very uniform, naturally vary somewhat in accordance with the tonnage required, with the deliveries and with the character of the Iron, although in a broad sense the range given below covers the entire market. As already stated, furnaces have about all they can do to make good their deliveries during June and July, and are therefore not disposed to quote for additional tonnage for the months named, although that does not necessarily imply that consumers will be unable to get enough Iron to meet their requirements during that period. The situation, however, is evidently such that there is little chance for any appreciable decline in prices. The output will no doubt increase somewhat, but the bareness of stocks and the large consumption which is now regarded as assured for the remainder of the year are expected to keep things on an even keel. In view of these conditions buying will probably be in good volume during the next few weeks. Consumers are beginning to feel that there will be no decline of any account, and this is usually followed by a liberal distribution of orders. The week, as we have already said, has been moderately active, taking in all the various grades, at about the following quotations for Philadelphia and nearby deliveries:

No. 1 X Foundry	$19.25 to $19.50
No. 2 X Foundry	18.50 to 18.85
No. 2 Plain	18.25 to 18.50
Standard Gray Forge	16.50 to 16.75
Ordinary Gray Forge	16.00 to 16.25
Basic	17.60 to 17.75
Low Phosphorus	24.50 to 25.00
Malleable	19.25 to 19.50
Bessemer	20.00 to 20.25
Lake Superior Charcoal	21.00 to 21.50

Steel.—The market is not as brisk as it was some time ago, but at the reduced quotations there are indications of new business coming in. Prices now asked are $28 to $28.50 for ordinary Steel, and $31 to $32 for Forging Steel.

Steel Alloys.—The market is easier, and may be quoted at about $90 for June and July Ferro, and $78 for last half of the year. Spiegeleisen is easier at $30 to $32 on dock. Some now afloat has been offered at a little less than $30.

Plates.—Business is not as active as could be desired, although some departments are running full. The productive capacity is very large, however, and it requires a larger tonnage than ever before to keep all the mills going. Prospects are considered favorable, and it is expected that a good amount of new business will be coming in during the next few weeks. Prices are unchanged, as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel	1.73½	1.78½
Flange or Boiler Steel	1.83½	1.88½
Marine	2.13½	2.18½
Locomotive Fire Box Steel	2.23½	2.28½

The above are base prices for ¼-inch and heavier. The following extras apply:

	Extra per 100 pounds.
3-16-inch thick	$0.10
Nos. 7 and 8, B. W. G.	.15
No. 9, B. W. G.	.25
Plates over 100 to 110 inches	.05
Plates over 110 to 115 inches	.10
Plates over 115 to 120 inches	.15
Plates over 120 to 125 inches	.25
Plates over 125 to 130 inches	.50
Plates over 130 inches	1.00

Structural Material.—It seems almost superfluous to say that business is good, and with the contracts recently entered into for bridges, tunnels, terminals, &c., it is considered certain that this will continue for an almost indefinite period. Prices are as last quoted, namely: Beams, Channels and Angles, 1.83½c. to 2c., delivered.

Bars.—This interest is not in as good condition as most other departments are. Consumption is large and bids fair to continue so, but many of the mills are beginning to need new business, and the eagerness to secure it encourages buyers to contend for lower prices. As a rule, first class Bar Iron commands full quoted rates, but there are a few "outside" mills that make fractional concessions when good business can be had, but 1.63½c. to 1.68½c. are regarded as established prices for either Steel Bars or best Refined Iron.

Sheets.—There is more demand for Sheets, and while prices are unchanged, the mills manage to secure a fair tonnage of orders. We quote: Nos. 18 to 20, 2.40c.; Nos. 22 to 24, 2.50c.; Nos. 25 and 26, 2.60c.; No. 27, 2.70c., and No. 28, 2.80c.

Old Material.—The demand does not improve, and, if anything, prices are a shade lower than they were a week ago. Some holders refuse to recognize the changed conditions and prefer to carry stock rather than meet the market at present prices. Consumers are equally indifferent, however, so that a rise or fall from present figures remains an open question. Bids and offers for deliveries in buyers' yards are fairly represented below:

Scrap Steel Rails and Crops	$16.25 to $16.50
No. 1 Steel Scrap	16.00 to 16.25
Low Phosphorus Scrap	20.50 to 21.00
Old Steel Axles	19.00 to 20.00
Old Iron Axles	25.00 to 25.50
Old Iron Rails	21.00 to 21.50
Old Car Wheels	16.50 to 17.50
Choice Scrap, R. R., No. 1 Wrought	18.75 to 19.25
Choice No. 1 Yard Scrap	17.00 to 18.00
Long and Short	16.00 to 16.50
Machinery Scrap	15.50 to 16.00
Wrought Iron Pipe	13.50 to 14.00
No. 1 Forge Fire Scrap	14.00 to 14.50
No. 2 Light Ordinary	10.00 to 11.00
Wrought Turnings	12.75 to 13.25
Axle Turnings, Choice Heavy	13.50 to 14.00
Stove Plate	11.50 to 12.00
Cast Borings	9.50 to 10.00

Hamilton King, United States Minister to Siam, forwards specifications and blue prints for bids on a railroad bridge for the Royal Siamese Railway. These can be secured by American bridge companies from the Bureau of Manufactures. The Department of State has cabled Minister King at Bangkok that one or more firms in this country will probably bid. This is the first time it has been possible to get an open tender on bridges from the railway department of Siam. For a long time German firms furnished all railroad supplies. The bridge is to span the Menam River, with a single track of 1.435-m. gauge.

Cleveland.

CLEVELAND, OHIO, May 28, 1906.

Iron Ore.—The movement of Ore down the lakes in May has been at an irregular rate. Some preliminary estimates indicate a movement of approximately 4,000,000 tons, but it is understood that the result of the strike was a curtailment in the movement of about 1,000,000 tons, so that the total up to June 1 is likely to approach 5,750,000. In addition to the movement of some Ore all through the strike, the docks made unusually good time immediately after it was ended. The unloading of boats at the lower lake ports is rapid this year, the same exceptional dispatch being given as was seen last year. In outlining the possibility of a rapid movement of Ore during the season, attention has of necessity been directed to the question of loading and unloading facilities. The docks are working rapidly on Lake Erie, and it is apparent that for the time being the car supply is abundant. Upper lake docks are also taking care of the boats as readily as the lower lake docks have been doing, and 6,000,000 tons a month can be as readily done now as was 4,000,000 tons only a few years ago. Shippers are counting on a record amount of Ore, in case the activity of the blast furnaces seems to warrant it. Preliminary estimates of the season's movement now range close to 40,000,000 tons. Shippers explain this large increase by saying that it is partly due to the activity of the furnaces and partly to the necessity to ship more low grade Ores, since the higher grades are getting scarce. It is also understood that there is an increased movement from the Michipicoten territory this year to ports on this side of the border. Rates have not changed from 75c. from Duluth to Ohio ports, 70c. from Marquette and 60c. from Escanaba. The dock managers have fixed the unloading charge for the season at 20c. By conferences during the week all unsettled labor questions have been adjusted, with the exception of that of the firemen. The various lodges voted for a strike, but reconsidered their vote on instructions from headquarters and no more trouble is expected.

Pig Iron.—The Pig Iron market is holding about steady. Prices are practically unchanged, and the buying is about as it has been, there being a quiet absorption of material both for quick and future delivery. Of late some of the buyers have shown a little more disposition to cover for the fourth quarter. Some Iron is still being sold at $16 in the valleys for No. 2. A foundry interest intimates that it has been able to buy at $15.50 for No. 2 in the Valley, but this is not credited by sellers. In Basic the market is strong at $17 in the valleys. The Bessemer market ranges from $17.25 to $17.50 in the valleys, with a good demand. The Coke market is stronger. River furnace, this city, is out of blast, as is one Hubbard furnace. The Dover furnace is running on Basic at present. An important furnace interest is sold up for the third quarter.

Finished Iron and Steel.—The announcement of an advance in Sheets is expected in some quarters, in view of the high price of Sheet Bars. Jobbers here have not advanced Sheet prices, but may do so shortly. On such business the market holds at 2.15c. for No. 10 Black Sheets, 2.70c. for No. 28 One Pass Cold Rolled and 3.70c. for No. 28 Galvanized. The shortage of Steel has not been relieved, and some consumers are having difficulty in meeting their orders with any profit to themselves. Forging Billets continue to sell around $35, at Pittsburgh mill, with some sales being made as high as $36. Steel Bars continue fairly strong, with steady buying from the finishing mills in northern Ohio. The price holds at 1.50c., Pittsburgh. Some consumers, however, are disposed to hold off for lower prices. Bar Iron is weak, with prices generally quoted at 1.50c., Pittsburgh. Specifications in Structural Shapes are more numerous and easier to obtain. A new ship order is reported as immediately ahead. The report comes from shipbuilding headquarters. It is believed to be an experimental order. In Plates boilermakers are taking a good tonnage.

Old Material.—Buying has been a little heavier and this has stiffened prices. The following are dealers' prices to the trade, f.o.b. Cleveland, gross tons: Old Steel Rails, $14.50 to $15.50; Old Iron Rails (nominal), $22 to $23; Iron Car Axles (nominal), $18.50 to $19.50; Heavy Melting Steel, $15. Net tons: Cast Borings, $8.50 to $9; No. 1 Busheling, $12.50 to $13; No. 1 Railroad Wrought, $16; No. 1 Cast, $14 to $14.50; Iron and Steel Turnings and Drillings, $9.50 to $10.50.

Chief Roderick of the State Department of Mines of Pennsylvania has issued an abstract from his annual report for 1905, showing that the total amount of anthracite coal mined in 1905 was 62,441,134 gross tons for market and 6,359,280 tons for steam and heat at the collieries; 1,420,140 tons were sold to local dealers or used by employees. During the same period the total production of bituminous coal was 119,361,514 tons.

New York.

NEW YORK, May 29, 1906.

Pig Iron.—The market for Foundry Iron has been quiet and is rather easier. Sales have been confinned to small lots. Sales aggregating about 10,000 tons have been made to a Cast Iron Pipe manufacturer in the Philadelphia district, and some additional lots of Basic have been sold for the Structural mill of the Steel Corporation. We note also sales of Charcoal Iron, aggregating 3000 tons, to a Car Wheel foundry in the Lehigh Valley. We quote: No. 1 Foundry, $18.50 to $19; No. 2 Foundry, $18 to $18.50; No. 2 Plain, $17.50 to $18; Southern No. 1 Foundry, $18.25 to $18.50, and No. 2 Foundry, $17.25 to $17.50.

Steel Rails.—Some of the details of the recent heavy Western business for 1907 are just coming out. The Northern Pacific took 5000 tons additional, making 45,000 tons in all. The C., B. & Q. ordered 25,000 tons, the Illinois Central 40,000 tons, the Great Northern 20,000 tons, this being in addition to its first order; the Wheeling & Lake Erie 10,000 tons and the Chicago, St. Paul, Minneapolis & Omaha 10,000 tons. It is understood that in addition to the above the Illinois Central has contracted for a certain tonnage of Open Hearth Rails from the Alabama mill. The Tidewater Railway has ordered 27,000 tons of Bessemer Rails for 1907 and the New York, Ontario & Western 4000 tons. New business for this year's delivery reported this week includes 3000 tons for the Wabash, 2100 tons for the Boise (Idaho) Interurban Railway, 1600 tons for the Boston Elevated Railroad, 9000 tons for the Florida East Coast, 2000 tons for the Cumberland Valley, 1600 tons for the Fort Smith Lumber Company, besides a number of small orders and some business from frog and crossing companies.

Structural Material.—The largest Structural contract of the year thus far was closed this week, when the American Bridge Company secured the Steel erection for the tunnel terminal building of the Hudson Company, at Church, Cortlandt and Fulton streets. Upward of 28,000 tons will be required. The same company was awarded the Steel work for the new Trinity Building on Broadway and for the North Trinity Building adjoining, requiring together about 10,000 tons. It has also taken the contract for the Normal Latin School at Boston, 2000 tons, and for the Bronx court house, 700 tons. For May the total bookings of the company have been 60,000 tons. References have been made in the daily press in the past week to the extensive tonnage of Steel work for the new Pennsylvania terminal station at Thirty-third street and Seventh and Ninth avenues, as though the award had just been made. As a matter of fact these contracts were let months ago, and deliveries of Steel were begun last year. Some bridge work has been given out by the Baltimore & Ohio Railroad, 2400 tons gong to the Phœnix Bridge Company. The Structural Steel work for an 11-story office building at 25 and 27 Liberty street and 56 Maiden lane has been awarded to the Passaic Steel Company, Paterson, N. J. There is still a good deal of business hanging over the market. Mills, with the increased capacity brought into requisition in recent months, are making rather more satisfactory shipments. Foreign business could be done at £6 6s., c.i.f. New York, but there is nothing to report, German mills being too well booked to make any great effort in this direction at present. We continue quotations on mill shipments for New York delivery as follows: Beams, Channels, Angles and Zees, 1.84½c.; Tees, 1.89½c.; Bulb Angles and Deck Beams, 1.99½c. Beams, 18 to 24 inches, 0.10c. extra; Angles, over 6 inches, 0.10c. extra. Beams and Channels from stock are sold at 2.50c. to 2.75c.

Bars.—Trade continues rather quiet, but prices are well maintained. Both Iron and Steel Bars are quoted at 1.64½c. to 1.69½c., tidewater, according to deliveries and specifications.

Plates.—T. A. Gillespie of Pittsburgh was the lowest bidder on the the Riveted Pipe required for the Borough of Brooklyn, at the letting last Wednesday by the Department of Water Supply and Electricity of the City of New York. It is understood, however, that this Pipe will be made by the East Jersey Pipe Company, Paterson, N. J., and that it will require about 12,000 tons of Plates, instead of 10,000 tons, as previously estimated. The Plates will be ⅝ inch thick instead of ½ inch. The local Plate market is exceedingly quiet, very few inquiries now coming forward. No changes in price are reported. Quotations are as follows, at tidewater: Sheared Tank Plates, 1.74½c. to 1.84½c.; Flange Plates, 1.84½c to 1.94½c.; Marine Plates, 2.14½c. to 2.24½c.; Fire Box Plates, 2.24½c. to 2.60c., according to specifications.

Cast Iron Pipe.—At the letting reported in the previous paragraph the same bidder secured the Brooklyn contract for 2000 tons of Cast Iron Pipe and 300 tons of specials. It is expected that this Pipe will be purchased from an Eastern foundry. No other business of importance in this line transpired during the week, but foundrymen report a constant pressure for small lots. The demand is most urgent for Pipe for quick delivery, which the manufacturers are unable to supply. Carload lots of 6-inch Pipe continue to be quoted at $30.50 per ton at tidewater.

Old Material.—All kinds of foundry stock are in good demand, such as Machinery Cast, Stove Plate, Grate Bars, Malleable Cast and Old Car Wheels, but other classes of material are quiet. Prices are weak. A development of the current market is the fact that dealers who purchased quite heavily some weeks back, when the demand appeared to be increasing, are now confronting imperative requests for shipping instructions and are obliged to accept concessions in order to accomplish sales. This has weakened the market quite a little and prices show some reductions. The movement of Steel Scrap is still interfered with by embargoes on shipments to Steel works. Relaying Rails are active and sales are being made at full prices. Approximate prices per gross ton for New York and vicinity are as follows:

Old Iron Rails	$20.50 to $21.00
Relaying Rails	25.50 to 26.00
Old Steel Rails, rerolling lengths	16.50 to 17.00
Old Steel Rails, short pieces	15.50 to 16.00
Heavy Melting Steel Scrap	15.50 to 16.00
Standard Hammered Iron Car Axles	25.50 to 26.50
Old Steel Car Axles	20.00 to 20.50
No. 1 Railroad Wrought	18.00 to 19.00
Iron Track Scrap	16.00 to 17.00
No. 1 Yard Wrought, long	16.50 to 17.00
No. 1 Yard Wrought, short	14.50 to 15.50
Wrought Pipe	13.50 to 14.00
Light Iron	10.00 to 10.50
Cast Borings	9.00 to 9.50
Wrought Turnings	12.00 to 13.00
Old Car Wheels	17.00 to 18.00
No. 1 Machinery Cast	15.50 to 16.00
Stove Plate	11.50 to 12.00
Grate Bars	10.50 to 11.00
Malleable Cast	16.50 to 17.50

Metal Market.

NEW YORK, May 29, 1906.

Pig Tin.—The chief news of the week was the auction sale of Banca Tin in Holland, which went at an average of 108⅞ florins, equivalent to 40c., c.i.f. New York, or £181 5s. in London. This low price may have been brought about through the manipulation of the London market on Monday. The upward trend of that market this afternoon would confirm that view, as the market closed firm at £186 for both spot and futures, a net advance of £3 10s. for the day. The trading there was also heavy. The premium on spot in this market is slowly disappearing, but there is little spot in store. The bulk of the recent arrivals has gone into consumers' hands. It is believed that despite the strength of to-day's market prices will work lower, as the heavy consuming season is about over. To-day's price in New York is 41c. The arrivals so far this month aggregate 3737 tons, and there are afloat 1278 tons.

Copper.—The statistical position is strong, and the foreign demand is most excellent, as shown by the exports of 17,181 tons for the first 28 days of this month. Imports are heavy, too, but still European consumers are buying freely for August delivery. The larger melters are well supplied with June and July Copper. Domestic users of the metal have also covered freely for the next three months, but there has been little September to December sold. Too much importance should not be attached to the recent Governmnt purchase of 200,000 lbs. per month for delivery during the next 13 months at 18.85c., as many of these contracts have so many restrictions that all but a few sellers are excluded. The general range of prices is unchanged at 18.75c. to 19c. for spot Lake, 18.62½c. to 18.87½c. for futures; for spot Electrolytic probably 18.62½c. to 18.87½c. would be asked, while future deliveries can be obtained at 18.50c. to 18.62½c. For all grades of Casting and all deliveries 18.12½c. to 18.50c. is asked. The London markets are higher at £85 15s. for spot, £85 2s. 6d. for futures and £90 for Best Selected.

Pig Lead.—Imported Lead can be bought at 5.95c., but there appears to be no domestic offerings under 6c., New York. In St. Louis prices are firmly maintained at 5.90c. The American Smelting & Refining Company continues its old price of 5.75c. for outstanding contracts, but is accepting future business only at price current on date of shipment. The London market is lower at £16 15s. for Soft Spanish.

Spelter.—Prices are without change, consumers being able to satisfy their wants in the New York market at 5.90c. to 5.95c., and shipments from the West are held on a basis of 5.80c. There are said to be large orders for Spelter at 5.75c., St. Louis, but with no takers. The trade is taking round lots of the metal, but business is very even. The London market is unchanged at £27 10s.

Aluminum.—The principal producer of the metal is making some headway as far as filling old contracts is concerned, but there is little or no metal available for immediate shipment. Prices are nominal, with 35c. quoted for No. 1 Ingots and 33c. for No. 2 Ingots.

Quicksilver.—There is a fair demand, dealers holding flasks of 75 lbs. at $41 per flask. In San Francisco $40 per flask is quoted for domestic orders and $39 for export. The London market is unchanged, Rothschild's quotation being £7 5s.

Antimony.—There is some irregularity in the market, due to holders being willing to cash in on long standing profits. The metal is nominally quoted at 27c. to 28c. for Cookson's and Hallett's; other grades at 26½c. to 27½c.

Nickel.—Is unchanged, large lots being obtained at 40c. to 45c.; smaller quantities at 50c. to 60c.

Tin Plate.—There is a slight falling off in the demand, but prices are firm at $3.75, f.o.b. Pittsburgh; $3.94, f.o.b. New York, for 100-lb. Coke Plates. The Welsh market is unchanged at 12s. 9d.

Old Metals.—There is an excellent demand for Copper Scrap and Old Lead, but dealers have little of these supplies to offer. For such business as is ruling about the following selling prices are named by dealers:

	Cents.
Copper, Heavy Cut and Crucible	18.00 to 18.25
Copper, Heavy and Wire	17.75 to 18.00
Copper, Light and Bottoms	16.00 to 16.50
Brass, Heavy	12.50 to 13.00
Brass, Light	10.50 to 10.75
Heavy Machine Composition	16.50 to 17.00
Clean Brass Turnings	11.50 to 11.75
Composition Turnings	13.50 to 14.00
Aluminum Scrap	26.00 to 28.00
Lead, Heavy	5.45 to 5.60
Tea Lead	5.20 to 5.35
Zinc Scrap	4.90 to 5.00

Iron and Industrial Stocks.

NEW YORK, May 29, 1906.

Transactions have been light in iron and steel stocks since our last report, but the general tendency has been strong. Fluctuations have not been wide, although Tennessee Coal and Colorado Fuel made a little spurt on Friday. That day appeared to be the highest point for most of these stocks during the period under review, as since that time a slight recession has occurred. Republic preferred has been exceptionally strong. The range of prices from Thursday to Monday, inclusive, on active stocks was as follows: Car & Foundry common 40½ to 41⅝; Locomotive common 68 to 70¾; Colorado Fuel 51⅜ to 55⅜; Pressed Steel common 50½ to 51⅝; Republic common 27¼ to 28½, preferred 102⅜ to 103⅜; Sloss-Sheffield common 78¾ to 80½; Tennessee Coal 149¼ to 152⅜; Cast Iron Pipe common 49¾ to 52⅞; Steel common 40 to 41⅜, preferred 105¼ to 106⅛. Last transactions up to 1.30 p.m. to-day were reported at the following prices: Can common 7½, preferred 62¼; Car & Foundry common 41⅛, preferred 102; Locomotive common 69⅝, preferred 114; Steel Foundries common 10⅝, preferred 44¾; Colorado Fuel 56; Pressed Steel common 51½, preferred 97⅛; Railway Spring common 52; Republic common 28, preferred 103⅜; Sloss-Sheffield common 79⅜; Tennessee Coal 151½; United States Cast Iron Pipe common 52½, preferred 94; United States Steel common 40¾, preferred 105⅝.

Stockholders of the Clark Coal & Coke Company, Pittsburgh, have decided to increase the capital stock from $200,000 to $500,000, and to increase the indebtedness by the issue of $200,000 6 per cent. bonds. The money is to be used for improvements and additions to its plants in Butler County, Pa.

Wall Street was exercised May 23 over a report that the United States Steel Corporation contemplated issuing $50,000,000 bonds in connection with the new steel plant in Indiana. The report temporarily affected the steel stocks and others, but Judge Gary, chairman of the board of the Steel Corporation, gave it prompt denial. He said: "The question of a bond issue has not been and is not now under consideration by the United States Steel Corporation for the financing of the new Indiana plant or for any other purpose. Thus far all the expenditures on that plant have been made out of earnings and are likely to be for some time. Whether the management will conclude to make all the expenditures out of earnings, or finance the new plant in some other way, has not been fully determined. At present the corporation is not in need of money and was never so easy in respect to its finances. It has never been in better financial shape than at the present moment."

Dividends.—Railway Steel Spring Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable June 20.

American Brake Shoe & Foundry Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock and 1 per cent. on the common stock, both payable July 2.

Buffalo & Susquehanna Iron Company has declared a dividend of 15 per cent.

Coal operators in Illinois decided on May 28 to grant the miners the scale of 1903. In return the miners have agreed to pay the wages of shot firers and to ask for the repeal of the law by the next Legislature. They will also indemnify the operators for the loss sustained through the action of pit committees in calling unauthorized strikes. The strike began on April 1, and involved 55,000 men.

The Heat Treatment of Steel.

In his James Forrest lecture, recently delivered by Robert A. Hadfield of Sheffield, England, on "Unsolved Problems in Metallurgy," he has the following interesting discussion of heat treatment:

As an illustration of the complex nature of the problems with which the metallurgist has to deal I will specially refer to one—that is, the effect of heat treatment upon the metal iron and its alloys. It is well known that chemical activity is greatly increased by a rise of temperature, and this may partly explain the extraordinary changes brought about in iron and steel when heat treated. Direct evidence on this point is difficult to produce; we must be content to know that by certain heat treatment profound changes do occur in the physical qualities of the iron or steel. Let me give one illustration of the remarkable effect of heat treatment upon an ordinary carbon steel, of tool steel quality, having the following composition: Carbon, 1.16 per cent.; silicon, 0.07 per cent.; manganese, 37 per cent.

Although it is generally known that such a steel will harden at certain temperatures and will not harden at others, it was only quite recently discovered how fine is the dividing line—not more than a few degrees. S. N. Brayshaw even claims that but 1 degree C. will cause considerable difference in physical qualities, and I believe he is not far from the truth. A joint research by him and myself is at present being carried on, which, it is hoped, may throw light upon this interesting question.

There is nothing mysterious in the knowledge gained in this field of research, but it has taken centuries to discover these important facts. Now, by means of modern pyrometers, all ranges of temperatures can be read with great accuracy, and it is found that carbon steel of the composition mentioned, when heated to 725 degrees C. and quenched in brine, will afterward bend cold 43 degrees, its Brinell hardness number being 228. Quenched at 735 degrees C., or 10 degrees higher, the quenched specimen, when cold, bends only 1.5 degree, the Brinell hardness number being increased to 512. Quenched at 740 degrees C. the bend is nil and the hardness number 713; in other words, the steel is completely hardened. Thus we have the remarkable fact that by increasing the temperature only 15 degrees C. we get the phenomenon of complete hardening. Other important changes are those occurring both at lower and higher temperatures. Further, there are critical changes at the high temperatures of 900 to 1000 degrees C., and these, it must be remembered, are temperatures at which forging and rolling are usually carried on. There are also variations in hardening temperatures.

Again, in dealing with changes of temperature, the influence of mass must be considered. At a given crystallization produced by temperature a large mass will not necessarily behave in the same manner as a small one, and the duration of the heat treatment is also important. As striking instances of the importance of heat treatment, I may mention the hardness of the face of armor plate, made to keep out projectiles, and that of the projectiles made to perforate the armor. The entire success or failure of their manufacture turns upon heat treatment. Profound magnetic changes are produced in iron by temperatures ranging from that of liquid air to that of high degree, 1000 degrees C. or more. With the latter is closely associated a most interesting and suggestive phenomenon—recalescence—for the discovery of which we are indebted to an Englishman, Prof. W. F. Barrett.

While the high nickel iron alloys and iron manganese alloys appear practically nonmagnetic at atmospheric temperatures, upon cooling down in liquid air they become considerably magnetic and remain in this state until again raised to about 500 degrees C., when they become nonmagnetic. This cycle can be carried out as often as desired with the same result. These structural changes must be very great, for the special steel containing 20 per cent. of nickel, which is almost nonmagnetic or only feebly so, has a tenacity of 44 tons per square inch, an elongation of 55 per cent., a reduction of area of 63 per cent., and can be readily machined at ordinary

temperatures. Upon being immersed in liquid air, however, it becomes strongly magnetic, its tenacity increases to the extraordinary figure of 157 tons, while its ductility still remains fairly high—namely, 15½ per cent.—and it can now only be machined with difficulty. This steel, after returning to atmospheric temperature, retains a tenacity of no less than 115 tons per square inch, or more than two and a half times that of its original condition, and has an elongation of 4½ per cent.

The alloy of iron and manganese, with which I have worked so many years, is not, singular to say, affected by any change in temperature, whether the highest or that of liquid air; it always remains nonmagnetic, except when annealed for a long period.

Germany Reaches Its Tariff Limit.

A Berlin cablegram states that on May 26 the Reichstag adopted by a large majority a resolution presented by the Committee on Commercial Treaties, with the approval of the government, regarding any new treaty that may be negotiated, as follows:

1. The general tariff now in force shall not be reduced below the rates already granted to countries having reciprocal treaties with Germany.

2. Before any new treaty is concluded a meeting must be called by the government of the Commercial Committee for the Preparation of Commercial Treaties, newly created by the imperial Interior Department, to hear the views of the committee and of experts representing the various commercial and industrial interests.

Vice Chancellor Count von Posadowsky-Wehner, who did not mention the United States, though it was obvious that the resolution relates to the prospective negotiations with the United States, added that it would be necessary in subsequent negotiations that the government hear the opinions of experts representing the affected industries before closing a new treaty.

The Supreme Court of the United States on May 28 reiterated its decision of last term in the Philippine tariff cases of Warner, Barnes & Co. and Frederic W. Lincoln, involving the validity of tariff collections in the Philippine Islands under the Executive order of 1898. The cases involved the right to collect a duty upon imports into the Philippine Islands from the United States between April 11, 1899, the date of the ratification of the treaty of peace with Spain, and October 25, 1901, when Congress passed an act providing a civil government for the Philippines. The court decided that the collection of such duties was illegal.

The lockout of 60 per cent. of the men in the metal working trades of Germany, of which the general association of metal working establishments gave notice May 17, will go into effect June 2, according to a press dispatch from Berlin. More than 165,000 men will be directly affected.

September 1 is the date fixed for changing from steam to electricity the railroad system centering in the New York Central Railroad station in New York City, and extending about seven miles out on the main line, and 12 miles on the Harlem division. Early in 1907 the electric service will be extended very much further.

S. P. Mitchell has resigned as chief engineer of the American Bridge Company. The office will be abolished June 1, and in its stead the office of general manager of erection will be created, to which H. F. Lofland has been appointed.

The E. & G. Brooke Iron Company, Birdsboro, Pa., has taken a license for the use of the Gayley system of dry air blast at its two Keystone furnaces and will install the apparatus at once.

A New Law for Power Boats.

WASHINGTON, D. C., May 29, 1906.—The vexed question as to how launches and other small power boats propelled by gasoline engines, electric motors, &c., can be placed under limited Federal supervision without restricting their use has finally been settled by the passage by both houses of a bill which the President has just signed. The matter is one in which builders of small engines, motors and power boats of all kinds have manifested a very lively interest, and the various measures pending in the past four years have been the subject of repeated hearings before the House Committee on the Merchant Marine and Fisheries, at which more than a score of prominent manufacturers have expressed their views.

When this matter was first brought to the attention of Congress by the officials of the Treasury Department, who then had control of the steamboat inspection service, a measure was drafted providing that all power boats should carry both pilots and engineers. Engine and boat builders urgently protested against this measure, on the ground that it would be absolutely prohibitory and would restrict the output of small boats, which are now annually built by the thousand in yards of various sizes, both on the great lakes and at tidewater. The opposition to this form of legislation was so strong that the bill was finally amended so as to provide that a competent person might act as both engineer and pilot. While this concession was important it did not meet with the approval of boat and engine builders, as under the construction given it by the officials of the steamboat inspection service it would require any person operating one of these small boats to pass a Federal examination and take out a regular license as a marine engineer in addition to qualifying as a pilot. Although the bill passed one house or the other in each of the last two Congresses, the opposition was so strong that it was finally abandoned.

In the present Congress, however, the attempt to pass a drastic measure was abandoned and a moderate bill was introduced, the chief feature of which was a requirement that persons navigating small vessels under 15 tons, while carrying passengers, shall be duly licensed. It was provided that no examination should be required as a condition of obtaining a license, but that it might be revoked by the local Board of Inspectors for misconduct, gross negligence, &c. Other provisions are in part as follows:

The hull and boilers of every ferryboat, canal boat, yacht or other small craft of like character propelled by steam shall be inspected under the provisions of this title. Such other provisions of law for the better security of life as may be applicable to such vessels shall, by the regulations of the Board of Supervising Inspectors, also be required to be complied with before a certificate of inspection shall be granted, and no such vessel shall be navigated without a licensed engineer and a licensed pilot; provided, however, that in open steam launches of 10 gross tons and under, one person, if duly qualified, may serve in the double capacity of pilot and engineer. All vessels of above 15 gross tons carrying freight or passengers for hire, but not engaged in fishing as a regular business, propelled by gas, fluid, naphtha or electric motors, shall be, and are hereby, made subject to all the provisions of section 4426 of the Revised Statutes of the United States relating to the inspection of hulls and boilers of this title applicable to such vessels, or of rules or regulations lawfully established thereunder.

All vessels of 15 gross tons or less propelled in whole or in part by gas, gasoline, petroleum, naphtha, fluid or electricity, and carrying passengers for hire, shall carry one life-preserver, of the sort prescribed by the regulations of the Board of Supervising Inspectors, for every passenger carried, and no such boat while so carrying passengers shall be operated or navigated except in charge of a person duly licensed for such service by the local Board of Inspectors. No examination shall be required as a condition of the obtaining of such a license, and any such license shall be revoked or suspended by the local Board of Inspectors for misconduct, gross negligence, recklessness in navigation, intemperance or violation of law on the part of the holder, and if revoked the person holding such license shall be incapable of obtaining another license for one year from the date of revocation.

The provisions of the above law have already gone into force, and the Department of Commerce and Labor has provided the local boards of supervising inspectors with the forms necessary for the issuance of the licenses referred to.

W. L. C.

The Testing of Protective Coatings.

Among reports to be discussed at the Brussels congress of the International Association for Testing Materials in September, 1906, is one on "Methods of Testing the Protective Power of Paints Used on Metallic Structures," prepared by E. Ebert of Munich. Since the general subject of protective coverings for metallic structures is one to which considerable time is given at the meetings of the American Society for Testing Materials and will be discussed further at the Atlantic City meeting of the society in June, the following extracts from the International Association report will be of interest:

Rust Begetting Rust.

The view previously entertained by many manufacturers that the formation of rust tends to promote further oxidation by chemical means, and that therefore preparations containing oxide of iron exercise a prejudicial effect, has, as the result of extended experiment, been fully and completely disproved. Experiments with actual iron and rust have proved that if it is finely ground and rubbed up with linseed oil varnish it produces no prejudicial effect upon iron to which it is applied. If, however, rust has formed upon iron it acts very much like a sponge by virtue of its porosity; it collects the water, retains it and so considerably promotes the further rusting of the metal.

This phenomenon has been long familiar to experienced constructors, and is the reason why they always take care to build in such a way and to select the color of the paint employed so that any formation of rust can be easily recognized the instant it takes place. Pigments and binding materials are separate substances and do not form chemical combinations with one another. The pigment is exactly the same after the paint has dried as it was before being mixed with the liquid oil. The oil, however, closes the pigment as if in a sheath and does not itself attack the iron.* For example, a coating of paint, consisting of linseed oil and white lead, can be placed for weeks in dilute nitric acid without the least trace of metal going into solution, though, as is well known, pure white lead is rapidly dissolved by dilute nitric acid. We see, therefore, that the quality of an oil paint depends in the first place upon the quality of the linseed oil employed in its composition. The pigment itself plays a quite subordinate role, as long as it is surrounded by oil. If, however, it happens to be laid bare by mechanical or physical influences it may have the effect of rapidly destroying the paint. Neutral, acid proof pigments therefore are probably most suitable for use in such circumstances, where there are no objections to the class of color. Further, according to the above mentioned experiments, there can be no objection, particularly where the color does not matter, as in the case of body coats, to leaving the pigments out altogether.

The information which has been supplied to us from France, Germany, Russia and other countries does not show general agreement as to any particular antirust composition being superior to others. On the contrary, views differ very considerably. Agreement, however, prevails that the testing of such compositions prior to their use would not lead to the results desired by the institute.

None of the antirust preparations with so-called acid proof components have proved, according to my experience, adequately to resist the action of the acids of sulphur, which are contained in the smoke of locomotives.

If we are in a position to procure the materials from our own manufacture—namely the linseed oil and pigments and to mix them properly—there can be no doubt that reliable methods can be adopted to ascertain whether the materials are of good quality or not. The process, however, is only applicable in a small number of instances, and, considering the extensive character of the manufactures connected with the production of antirusting compositions, is hardly to be recommended. If, however, we desire to produce the antirust material on a large scale it may be advisable to procure the materials as is done in building contracts and to insure that they possess the necessary good qualities. The durability of the layer of preparation in contact with the metal depends upon the quality of the first coating of body color. It is in addition largely determined by observing the principle that it should only be applied in warm, dry weather, and only to surfaces which are themselves dry. Unfortunately the preparation of the body coat is not always carried out with the attention that should be bestowed upon it, but is often done by unskilled labor, particularly when the end of the contract period is approaching.

The Cleaning of Metal Surfaces.

In addition, the surface of the iron is often not properly cleaned, with the result that the body coats do not produce proper effect. In a short time they fall off altogether. Though the importance of cleaning has been pointed out it does not follow that the iron surfaces must be absolutely bright. Experiments which were carried out in the years from 1892 to 1896 in order to ascertain what was the effect of cleaning have proved that it is quite sufficient, in order to free the iron from all impurities, to go over it with a wire brush or scraper, or, if need be, to employ a hammer to knock off any adhering scale. The layer of oxide or rust which remains after this treatment does no harm, and is in fact serviceable, as the preparation adheres better to it than it would to a bright and polished iron surface. The management of one railway for many years maintained that the iron before being treated with the compositions should be cleaned bright in dilute hydrochloric acid, then immersed in lime water, washed in hot water, warmed up to a high temperature and after the very rapid drying, which then results, painted over with linseed oil varnish. Nothing can be said against this process when carried out on a large scale by competent workmen. It is, however, a very different matter when it is attempted on small work and with inadequate plant. In such cases there is always the danger that the hydrochloric acid, which has penetrated into the interstices of the iron, will remain there and produce a deleterious effect. Further, the experiments above referred to have shown that the methods adopted in the Bavarian state railways of using a body coat of linseed oil varnish without pigment has not caused any trouble. The articles are also subjected to examination after receiving the first coating when lying about waiting to be removed by consignees. Von Tetmejer and Dr. Landolt have recommended this process on various occasions. Objections have been raised by various parties that they have not been adequately supported. Taking into consideration the observations of the members of the international commission, I am prepared to agree with them to the effect that the durability of the antirust preparation depends upon the quality of the linseed oil employed, and we have accordingly devoted the greatest attention to the preparation of the latter. As to the linseed oil, it is very desirable that we should be in possession of some process which will enable us to ascertain quickly, simply and reliably what its quality is, even when already mixed with pigments.

* The English translator of the report, R. N. Lucas, excepts to this statement and says: "Is not this an error? The view generally prevailing in this country is that the oils take from the oxides with which they are mixed to form paints some of the oxygen required for their solidification."

A demand has been made upon the St. Louis Iron & Machine Works, St. Louis, Mo., which is considered typical of demands the International Association of Machinists will make in a large number of machine shops. It provides for a 54-hour week, the hours worked to be between 7 a.m. and 6 p.m. All work outside of the posted schedule of hours to be paid for as overtime at the rate of time and a half. Holiday work to be paid for at not less than double time. One apprentice is allowed for the shop and one in addition for every five machinists. A 10 per cent. increase shall be paid to all apprentices and machinists and no machinist shall be paid less than 30 cents an hour. None but machinists and machinists' apprentices may do machinists' work. The employer to receive a committee of his machinists to discuss any grievance and not to discriminate against any member of such committee. When such committee fails to adjust any difference the employer to meet the representatives of the International Association of Machinists.

The Machinery Trade.

NEW YORK, May 29, 1906.

Undoubtedly the event of the week in the machinery trade was the large list of machine tools received from the Baldwin Locomotive Works, which greatly increases the number of tools on which machinery merchants are bidding. Several smaller lists of tools were also issued within the past few days, and these, with those not yet closed, represent hundreds of thousands of dollars. The three principal lists on which no purchases have as yet been made cover about 437 machine tools, many of them of the heaviest class. This is quite an addition to the volume of inquiries that continues to come in, and if purchases are made in the near future business will show a further large increase, as there seems to be no likelihood of an abatement of the present heavy buying for some time to come.

The activity in mining operations in the West, which began early in the spring and gives promise of continuing all during the open season, has resulted in a boom in the mining machinery trade. This is also true with those who make smelting and refining machinery. The demand for the latter line does not come from the West alone, as there are many inquiries in this part of the country. Instead of being busy working for orders, as is usual at this time of the year, the trade is kept on the jump in supplying the demand and making the best possible arrangements for early delivery. The delivery question is one that is troubling those who handle mining machinery not a little. The demand in this line is generally for immediate supply, and the business does not offer opportunities to foresee what the machinery needs of the trade might be, as does that in the general manufacturing line. It is invariably the case that when a mining company puts out an inquiry it is for equipment that is needed at once. Most of the buying in this line, in fact, is for immediate needs, and while good prices are being obtained without trouble, some houses have been obliged to lose orders that they could have otherwise filled simply because they have been unable to supply the demand.

Locomotive Works' Large Machine Tool List.

During the past week the trade received specifications for a very large number of machine tools and merchants are now making up their bids. This extensive list was issued by the Baldwin Locomotive Works, Philadelphia, Pa., and covers about 300 tools, which will aggregate $250,000. The list is made up almost entirely of machine tools, some of them of the heaviest type, such as a 72-inch wheel press. Some 36-inch planers are required, and also several large lathes, a number of drills and all kinds of tools that are generally used in locomotive works. It is probable that a good portion of this machinery is to be installed in the plant at Eddystone, Pa., which was recently purchased by the Baldwin Works. This plant is to be extensively enlarged by the extension of two of the buildings 1000 feet. At that plant a smith shop, 50 x 400 feet, is also to be erected. In addition to this work a five-story building, 50 x 160 feet, is to be added to the main works at Broad and Spring Garden streets, Philadelphia, and another story is to be added to the office building.

Additional lists of tools are being sent out by the Pennsylvania Railroad, and within the past few days specifications covering quite a few tools have been received. The tools covered by these lists are understood to be additional to those mentioned in this column last week.

We hear from a reliable source that the large list of machine tools which has been expected daily from the New York, New Haven & Hartford Railroad has been passed on by the directors and has been given to the purchasing agent to send out for bids. It is expected now that the purchasing agent will send out this list as soon as he can get at it. The list is a very large one, and the machinery that will be purchased will be installed in the company's new shops at Readville, Mass.

Machinery is being purchased just now by the Frick Company, Waynesboro, Pa., to carry out the company's plans of extending its plant. The buying is being done at the company's office at Waynesboro, and a number of New York machinery men have journeyed there within the past few days to submit bids on specified machinery equipment. The company will build a boiler shop, 100 x 250 feet, and it is planned to equip it with a good assortment of the latest improved machinery. While the actual building operations have not been begun as yet, it is expected that the additions will be completed by next fall and all the equipment will no doubt be purchased before that time. The present boiler shop at the plant is to be used as an annex to the machine shop, and the contemplated improvements include the laying of about 2000 feet of new siding. The company is also considering the erection of other buildings, and it is expected that there will be a general extension which will necessitate the frequent addition of new machinery for some time to come. The company closed orders last week for a 15-ton electric traveling crane, and some time ago it purchased a 15-ton locomotive traveling crane.

The Hudson Companies are taking bids on considerable crane equipment, designed apparently for indoor service and probably for power equipment.

Work has been begun on the construction of the large plant of the Kennedy Valve Mfg. Company at Elmira, N. Y., which has been designed to take the place of the company's present manufacturing establishment at Coxsackie, N. Y. Contracts have been let for some of the buildings. The plant will include an iron foundry, 95 x 300 feet; machine shop, 95 x 300 feet, and a pattern shop and pattern storage building adjoining the iron foundry building will be 50 x 300 feet. These buildings are already in course of construction, and the other structures will include a brass machine shop, a brass foundry, assembling, testing and tool departments, a power house and other structures comprising a plant about 100,000 square feet in area. In the center bay of both the iron foundry and machine shop there will be a 15-ton traveling crane, with a 45-foot span, and other equipment for the buildings under construction will include cupolas, large machine tools and the like. All of the machinery will be independently driven by electric motors. The power plant, which is to be constructed so as to be completed by the time the three buildings now being built are finished, will be about 400 horse-power. The details regarding the machinery equipment have not been completed as yet. As soon as the structures under way are finished the company will move the departments they are to contain to Elmira, and the rest of the manufacturing departments will follow as the buildings for them are prepared. T. C. Flinn, superintendent of construction, has opened an office at 409-411 Realty Building, Elmira, and he is attending to all the construction and machinery details regarding the plant.

As a result of the fire which destroyed the large plant of the Zucker, Levett & Loeb Company, New York, on Saturday, the company will probably come into the market for quite a few machine tools. The company maintains an extensive plant and will no doubt rebuild as soon as possible.

The Selvay Smelting & Lead Company, San Francisco, Cal., is purchasing some equipment just now and its inquiries are being circulated among the trade in New York. The requirements include one 60-ton electric traveling crane. This company is one of the interests of the American Smelters Securities Corporation, formed some time ago by the Guggenheim interests to take over some of their smelting properties. These interests have been buying considerable in the market of late to carry out a number of general extensions planned early last winter, and it is not believed that the buying has by any means been completed.

Important Power Work.

The date of opening bids for the power and electric equipment for the Michigan Central Railroad has been extended from June 1 to July 1, and it is probable that awards will be made a month or so from the latter date. The specifications, which were issued in the middle of March, cover the erection of the power station and substations and the installation of machinery and all material that is necessary to operate an up to date electric line. The equipment of the power station will include water tube boilers, turbo-generators or other prime movers, surface condensers, electric traveling cranes, boiler feed pumps, horizontal feed water heaters, turbo-exciters, induction motors, mechanical stokers, coal and ash handling machinery, &c. There will also be required submerged vertical centrifugal pumps direct connected to motors. No matter who gets the general contract, New York machinery houses will no doubt get a large part of the business, as several of the large firms bidding on the blanket contract are receiving proposals on equipment they do not manufacture. The part of the line that is to be electrified is that adjacent to and through the proposed new tunnel under the Detroit River. The bids for the construction of the tunnel are all in and awards for this latter work can be expected almost any day.

The Erie Railroad has authorized the immediate electrification of about 35 miles of its line between Rochester and Mt. Morris, N. Y., which is to be done in accordance with the company's plans to electrify its Rochester division. This indicates that the company means to hurry along its work in that connection, and other announcements regarding authorization of similar improvements may be expected shortly. As has been stated, the company is constructing a large power house at Cornellsville, which is to be used for the easterly interurban lines, and it is expected that power for the Rochester extension will be taken from Niagara Falls. While a number of large contracts have been awarded for the Cornellsville power station, nothing has been done in that connection, it is understood, toward arranging for power equipment for the Rochester division, and although no power house will be required, much will be spent in the way of electrical apparatus for the improvement. The apparent haste for the arranging for the electrification of the Rochester division is explained by the fact that the Interurban Railroad Company recently organized to build an electric railroad along a route nearly paralleling the Erie

lines. It is to shut out this threatened competition that the electrification work is to be done. Nothing has been heard of late regarding the plans of the Interurban Railroad Company. In arranging for transmitting the power from Niagara Falls the Erie people have taken into consideration the possibilities for disposing of some of it for electric lighting and other power purposes along the route, and it is highly probable that something will be done in that connection.

Catalogues Wanted.—Eugene Sohm, 15 Rue Basse, Gand, Belgium, wishes to secure catalogues of hat making machinery.

Philadelphia Machinery Market.

PHILADELPHIA, PA., May 28, 1906.

The principal feature of interest in the local market during the past week has been the inquiry for a large number of tools by the Baldwin Locomotive Works, which has made an appropriation of $250,000 for the purchase of the equipment desired. Somewhat of an improvement has also been noticeable in the railroad demand. The Pennsylvania Railroad has inquiries out for a few tools, and there are indications that some of the other roads will follow with small lists. Large equipments for railroad shop use, however, will likely continue to be held in abeyance for the time.

The general demand for machine tools of all classes continues fairly good. There is no rush of business, but the aggregate volume of small orders placed reaches a very satisfactory total. Manufacturers in almost every line are busy, and in many instances are running their plants overtime in order to meet the demand. Orders received fairly well cover the average capacity of the shops and preclude the possibility of catching up to any extent on present delayed deliveries. This condition has in a number of cases held up the placing of orders by prospective buyers, which would have been promptly closed could reasonable delivery be obtained. There is scarcely a manufacturer who can make deliveries of any class of tools of the medium or larger sizes directly from stock. Here and there some sizes of the standard lines of tools are to be had for fairly prompt shipment, but the aggregate number is small. Dealers' floors continue bare of tools of desirable sizes, out of town builders of machine tools being in no better shape on deliveries than are local manufacturers.

The export demand for some classes of specialties has improved. Molding machines have been sold in better quantity, as have also some of the various machine shop supplies and equipment. The demand for the standard types of machine tools, however, continues irregular.

There has been a more active demand for boilers and engines, covering a fair range of powers. The outlook for future business in this branch of the trade is considered promising, and both builders and dealers anticipate some good orders in the near future. Some good sales of second-hand boilers and engines, mostly of the medium powers, have also been reported. Second-hand machine tools are being well taken, particularly those of the heavier types, although the delayed deliveries on new tools has in many instances increased the demand for second-hand ones of all types and sizes.

Iron and steel casting plants are having a large tonnage of business offered, in some cases more than can be taken care of by the individual foundries. Steel casting plants have a good volume of business on their books, in several instances their tonnage being almost entirely contracted for during the balance of the year. Gray iron foundries, while on the whole not as busy as the steel foundries, have a large amount of orders on hand, and deliveries are frequently equally as hard to obtain.

The Baldwin Locomotive Works has made an appropriation of $250,000 for the purchase of new machine tools for its local plant. Bids are now being asked for this equipment, which covers lathes, planers, drill presses, boring mills, shapers, &c. In fact, tools of almost every character are included in the specifications. These will be used to replace old tools, and to extend the facilities of the various departments of the plant. All this equipment is intended solely for the local plant, the equipment for the new Eddystone, Pa., foundry and smith shop not being included under the above appropriation.

The Department of Public Works, city of Philadelphia, Thomas L. Hicks, director, announces that owing to unavoidable delays in the preparation of specifications the opening of bids under contract No. 70, for 23 miles of 48-inch cast iron or steel pipe for the Torresdale pipe distributing system, as mentioned in these columns in the issue of May 10, has been deferred from June 4 to June 12, 1906.

A. Weiskittel & Son, Baltimore, Md., are building an addition, 60 x 100 feet, to their present foundry, the floor space of which will be used exclusively for molding purposes. This firm is also preparing plans for the building, and is ready to receive estimates for the equipment of a new foundry which will be erected at an early date.

The New York Shipping Company, Camden, N. J., has received a contract for a large steamship from the Pacific Coast Company, San Francisco, Cal., for service on the Pacific Coast. The vessel will be 416 feet long, 48 feet beam, and will maintain a contract speed of 15 knots per hour. This vessel will be a duplicate of one already building for the same company, the only exception being that the latter will have twin screws, while the former is of the single screw type.

The Philadelphia Roll & Machine Works continues to receive a large number of orders for both sand cast and chilled charcoal iron rolls, the tonnage aggregating the largest in the concern's history. Orders for rolling mill machinery for all classes of work, including a contract for two stands of three high 18-inch mills and two stands of two high 24-inch mills, with complete equipment for the Riverside Metal Company, Riverside, N. J., as well as general air furnace charcoal iron castings for machinery parts, have also been booked. Deliveries of all classes of castings are being made to various customers, while rolls are being shipped to many of the large iron and steel mills.

The Tabor Mfg. Company, manufacturer of foundry molding machines, is busy in all departments. The demand both from foreign and domestic sources continues good. Machines of the Tabor hinged type have had the greater sale recently, although a large number of split pattern and power ramming machines have also been sold. A large volume of business has also been done in Taylor-Newbold metal cutting saws, extensive deliveries being made to a number of the large steel casting and forging plants. Deliveries of molding machines have been large, particularly to parties in the New England and Middle Western States.

Alfred Box & Co., manufacturers of traveling cranes, both electric and hand power, continue to receive a large number of orders, including among others two three-motor 7½-ton special traveling cranes for lifting car bodies to be used in Ninth avenue and Twentieth street car shops, Brooklyn Heights Railroad Company, Brooklyn, N. Y.; one 15-ton three-motor traveling crane for elevated car shops of Brooklyn Heights Railroad Company, Fifth avenue and Thirty-fifth street shops, Brooklyn, N. Y.; one 30-ton four-motor traveling crane, having 5-ton auxiliary hoist for Lane & Bodley Company, Cincinnati, Ohio; one 10-ton three motor traveling crane for the new foundry of Barry & Zecher Company, Lancaster, Pa., and one 40-ton hand power traveling crane for power station of Atlantic & Gulf Portland Cement Company, Ragland, Ala. All departments of the plant keep extremely busy, and the outlook for future business is considered very favorable. Among some of the recent deliveries of cranes by the firm may be mentioned: One 10-ton three-motor traveling crane for the new foundry of Bernstein Mfg. Company, Philadelphia, Pa.; one 15-ton three-motor traveling crane for American Iron & Steel Mfg. Company, Lebanon, Pa., while five 15-ton three-motor traveling cranes for the substations of the New York Central & Hudson River Railroad at Kingsbridge, N. Y.; Yonkers, N. Y.; Mott Haven, N. Y.; Bronx Park, N. Y., and the Grand Central terminal, New York City, have recently been placed in commission.

New England Machinery Market.

WORCESTER, MASS., May 29, 1906.

The builders of radial drills have advanced prices 5 per cent., following the action of the manufacturers of other lines of machine tools. The change has already gone into effect. The understanding between the radial drill people extends beyond the members of the National Machine Tool Builders' Association, outsiders having entered into an understanding which cannot help being of great mutual advantage in the trade. Prices have been generally readjusted, so that the advance is upon a base price satisfactory to all concerned, which means that in some instances the increase in price is considerably in excess of the 5 per cent. The understanding applies not only to the builders of high priced radials, but to those who manufacture the cheaper class of this type of machine tool. The result is that the radial drill industry has been put on as satisfactory a basis as any line of machine tools, instead of being at a considerable variance of purpose, as has been the case in the past.

Donald Tulloch, Worcester, has been elected clerk of the Worcester Metal Trades Association and will have charge of the Worcester Labor Bureau, succeeding Herman S. Hastings, who has resigned to become a representative of the National Founders' Association. Mr. Tulloch is a newspaper man of wide experience and extensive acquaintance.

It is understood that the New York, New Haven & Hartford Railroad is planning to establish a second great locomotive repair shop as soon as that now under construction at Readville, Mass., is completed. The information is not official, but it comes from excellent authority, and, moreover, the project is entirely logical, as it follows out the general idea of repair work as indicated in connection with the shops now building. When announcement was made that the company would establish large shops for the repair of its locomotives in the vicinity of Boston it was officially stated that the intention was to care for repair work

of this description on divisions east of New London and Willimantic only. The shop will have a capacity of 45 locomotives a month, which is very large, but the requirements of the eastern portion of the New Haven system are very considerable. The company has repair shops at New Haven and at other points in the western part of its territory, but the shops are mostly small, having been acquired one at a time with the absorption of the small railroads which make up the greater part of the company's system. To handle this work economically it would be of great advantage to combine the small repair shops into one modern plant similar to that now under construction, which will cost about $1,000,000. The understanding is that such works will be built as soon as the present Readville shops are finished, and this is expected to be some time about the first of next year. It may be logically deduced, therefore, that next season will see the New Haven road in the market for another great amount of machine tools and other necessary equipment. The requirements of the Readville shops will amount to over $150,000 for machine tools alone, apart from engines, boilers, electrical equipment and cranes, and the shops for the western part of the system will be as large undoubtedly. Later on a western car repair shop may be built, but not next year surely, and perhaps not for several years, that at Readville being large enough for present purposes. The list of tools which will be required for the Readville shops is not yet out, though it was expected that it would be sent to the trade a fortnight ago. As a matter of fact, it is understood that there will be little opportunity for doing business with the company in the open market, because the list will specify with a good deal of exactness what tools the engineers in charge have chosen. This is the common practice of the railroads, so that it is expected in the trade. There is a feeling among the Boston dealers that a general contract for the entire machine tool equipment will be given to some one machinery house, which is another modern method of equipping railroad shops. This would mean that the fortunate dealer would let out a large part of the business to those dealers who have the agencies for such tools as are specified in the list and which the general contractor does not handle.

The Great Northern Paper Company, plans for whose new plant are being prepared by Garret Schenck, 440 Old South Building, Boston, has purchased much of the necessary equipment for its proposed new plant at Millinocket, Maine. The order for engines has been contracted for, and the boilers are practically decided upon. But the electric generating and other equipment and the turbine water wheels have not been purchased, because of delay in decision as to the water power which will be developed. This will depend upon the site, which is not certainly chosen. The $2,000,000 plant will have no machine shop, as the shops of a neighboring mill of the same company provide ample facilities for any necessary work.

The Knox Motor Truck Company, Springfield, Mass., is to erect a new factory building, 50 x 100 feet and two stories.

The Wright Wire Company, Worcester, Mass., will make extensive additions to its works at Palmer, Mass., which will relieve the Worcester plant and thus provide for the extension of departments in both Palmer and Worcester. The company has purchased the Palmer hat factory property, which will be devoted to the manufacture of wire clothes line, picture cord (the last an entirely new product for the company), wire staples, foundry riddles, flour and meal sieves. An addition to the Palmer wire mill will be erected, to be 40 x 50 feet, which will include space for a steel wire annealing department and a galvanizing plant of large capacity. Additional wire drawing machinery will be installed. The newly purchased building will be equipped with machinery from the Worcester works, which will relieve various departments in that city, permitting them to spread out and enlarge their product, a necessary result of the rapid increase in the company's business. The company will need a variable speed motor for the newly purchased building and some other electrical equipment.

The Bay State Brass Company, Haydenville, Mass., has been organized under Massachusetts laws, with a capital stock of $30,000, to manufacture plumbers' brass goods. A shop building, 35 x 50 feet and two stories, and a foundry, 30 x 34 feet, will be erected immediately. The buildings are designed to permit of enlargements as the need shall require. Orders for machinery have been placed, but the company requests catalogues of machinery employed in this class of work, and also catalogues of supplies used in the business. The officers of the company are: President, Hubert Smith; vice-president, M. J. Ryan; secretary, R. A. Cole; treasurer and general manager, Stephen Jorgensen; directors, these officers and G. M. Fitzgerald and W. A. Metcalf.

Adell Bros., Orange, Mass., machinists, will build an addition, 20 x 40 feet, to their shop. A gasoline engine will be required and some machine tools, the list of which is not yet ready.

The Stanley-G. I. Electric Mfg. Company, Pittsfield, Mass., has prepared plans for still another building, in addition to the large extensions already noted in this column. The building will be devoted to the switchboard department. It will be 80 x 325 feet and three stories, and will be an extension of the building at present devoted to the department, which is 60 x 200 feet. The new building will be of reinforced concrete.

The Whitney Mfg. Company, Hartford, Conn., is to erect a new plant on property acquired some time ago, comprising about 8 acres and having a long frontage on the tracks of the New York, New Haven & Hartford Railroad. The new buildings will be of reinforced concrete, of fireproof construction throughout. The main building will be 61 x 225 feet and four stories, which, with a single story extension of 64 feet, will give a floor space of about 62,000 square feet. Work will begin immediately and the company expects to occupy the plant by November 1, when it will vacate its present quarters in one of the Colt Armory buildings. The business is divided into three departments—chain, machine and miscellaneous. The company is manufacturing high grade driving chains for motor cars, bicycles, machinery, &c., hand feed milling machines, 20-inch water tool grinders, keys and cutters for the Woodruff patent system of keying, Presto chucks, collets and friction tapping devices and a small printing machine. Among other improvements planned is a larger line of hand milling machines, and larger stocks of keys, cutters and chain goods will be carried. Much attention has been paid to the comfort of employees in the plans for the new works, and pleasant quarters will be provided for reading, lunch rooms and smoking rooms, as well as space for lockers and washrooms.

The Eastern Forge Company, manufacturer of heavy forgings, which recently sold the property occupied by its plant at Nashua, N. H., will located its works at Portsmouth, N. H. Arrangements have been made for the purchase of the Portsmouth Machine Company's property in that city, which is desirably situated for the purposes of the business. The city has voted to exempt the company from taxation for a term of ten years. The plant will be altered to adapt it to its new uses, and it is expected that the removal from Portsmouth will be accomplished at an early date.

The Humphrey Machine Company, Keene, N. H., manufacturer of turbine water wheels, rotary fire pumps, mill supplies and special machinery, is to erect a new shop, to be 72 x 152 feet and one story. The shop will be equipped throughout with new machinery. It is expected that the building will be ready for occupancy about November 1.

The new machine shop buildings of the Waterbury Farrel Foundry & Machine Company, which have been described in this column, will be devoted largely to the company's press department, additional room being necessary to keep up with the demand for this class of machinery.

The Worcester Steel Foundry Company, Worcester, Mass., is to build a considerable addition to its works at Millbury, in order to be able to take care of its rapidly growing business. The addition will furnish space for offices, and when it is completed the main office of the company will be removed from Worcester to Millbury.

The machinists employed in a number of shops at Lynn, Mass., are on strike for shorter hours, but the plants of the General Electric Company at Lynn and that of the United Shoe Machinery Company in the neighboring town of Beverly are not affected.

Cincinnati Machinery Market.

CINCINNATI, OHIO, May 29, 1906.

Machine tool builders, without exception, are having all they can do. There are sufficient orders coming forward regularly to keep the matter of deliveries at about the same stage, and it seems well nigh impossible to draw them closer than two or three months. As the season advances it is very often the case that trade very materially slackens until midsummer, when things are at low ebb. Unless there is a very decided change in the next month or so this year will be an exception to the general rule; as a matter of fact, the exact reverse apparently obtains, and instead of business decreasing there is a very perceptible growth all along the line. Machine tool builders, as a rule, are anticipating the largest year since the inception of the industry, and if foreign demand continues to show the proportion of gain during the next three months that it has in the same time prior the indications are that their surmises are well founded and almost certain to be realized.

Mention has before been made in these columns in regard to the late convention of the National Machine Tool Builders' Association at Atlantic City, relative to the strength and remarkable growth of the organization and its influence on the trade generally throughout the country. Mr. Shipley of the Lodge & Shipley Machine Tool Company, who attended the meeting and who is one of the earnest workers of the organization, in speaking of this, said: "The most noticeable thing about the convention was the very serious manner in which the work was done and the intense interest manifested. Questions were debated exhaustively; so much so that the lathe men put in 16 hours' work in two days.

This association has grown to be one for which every member can have cordial respect, as some very vexatious questions have been eliminated therefrom. The sessions, while cultivating to a degree extensive acquaintance and good friendship, are primarily for business purposes and are by no means 'junkets.' The paper read by Mr. Bullard of Bridgeport on the apprenticeship system attracted most favorable attention and showed exhaustive study of the question. There were a number of new members admitted, and it seems probable that, the earnestness of purpose of these conventions being understood in general, in a short time this association will enroll as members practically all of the manufacturers of machine tools in the United States."

The steel foundry plant at Winton place is progressing nicely, and if there are no serious delays it will be in operation by the tenth of next month. The original plans provided for an acid open hearth plant and crucible plant for the manufacture of high grade work, which has not been changed in any way. There will, however, be added a complete basic foundry for the manufacture of railway castings, principally bolsters and truck frames. This addition has been made necessary owing to the fact that a large order for such castings has been offered and the entire product of the basic foundry has been sold until July, 1907. The addition of the basic foundry has not caused changes in equipment which have been provided for to take care of the increased product.

The J. M. Robinson Mfg. Company says that it is very busy at the present time, having received sufficient orders from San Francisco to make five or six carloads. A very heavy demand is noted along the line of corrugating machines, also sheet metal forming machines or toggle presses. A new design of power cornice press will in the near future be placed on the market.

The addition to the plant of the King Machine Tool Company is being hurried to completion and the structural work is about completed. This will increase the capacity of the plant fully 40 per cent. and will be equipped as soon as completed. Trade is excellent and owing to present crowded condition output is much restricted, but with the added floor space delay in deliveries will, it is hoped, be reduced to a minimum.

The J. A. Fay & Egan Company is expanding further and has secured a lot 60 x 120 feet at Central avenue and Augusta streets, where a new pattern shop will be erected. Last year the company added considerable in the way of floor space to its plant, but trade has increased to such an exten that more room is imperatively demanded.

The Dreses Machine Tool Company, which, it will be remembered, suffered serious loss by fire some months since, says that it is now comfortably settled in its new quarters on McMicken avenue and has practically a full force running. Through increased capacity it is hoped that it will be enabled within the next two or three months to regain a portion of the time lost by the fire and satisfactorily make deliveries of all orders that were at that time under contract.

The Fosdick Machine Tool Company says business has kept up remarkably well since the new management took charge; in fact, each month is showing an increase over the one preceding. Foreign demand is said to be especially brisk, and it is with great difficulty that it is able to make shipments in order to meet promised deliveries. It is running full force and could use more help, but this is the usual state of affairs with all the machine tool builders.

The Cincinnati Planer Company, as was intimated in these columns some weeks since, has in contemplation the erection of additional floors to the present building. Bids have been received and are now under consideration, but the contract has not yet been awarded. This addition will consist of two floors, 70 x 120 feet. It is the intention to move the lathe department to the upper floors and use the entire lower floors for erecting purposes. One reason that the matter has been held in abeyance and contracts not awarded is the fact that the company is figuring on a piece of property in the suburbs, and it may decide to move the entire plant rather than add to the present one. This will probably be fully determined within the next 30 days, but it is certain that something will have to be done very soon to increase the capacity of the present plant.

The Cincinnati Machine Tool Company says that business both in the domestic and export lines is keeping up remarkably well and no indications of any change are apparent. Orders have been placed for several additional machines, which are expected to be installed at an early date.

The Cincinnati Lathe & Tool Company, a new company that has been in operation several months, reports a large amount of work booked ahead even in the short time that it has been in existence, deliveries being some months behind. This company manufactures the 16-inch quick gear engine lathe with compound rest and the W. T. Emmes patent feed device, formerly built by the Fosdick people.

The Columbus Auto Axle Company, which was incorporated some time since for $255,000, has been reincorporated as the Direct Drive Axle Company, with a capital stock of $150,000, by C. T. Phillips, W. E. Campbell, C. O. Haines, I. M. Pleukarp and J. R. Fassig. The company will build a factory for the manufacture of a new automobile axle.

The J. Baum Safe & Lock Company has filed plans with the Building Inspector of Cincinnati for the erection of a two-story machine shop on Front street.

Government Purchases.

WASHINGTON, D. C., May 29, 1906.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until June 19 for rotary blowers, hydraulic jacks, reseating machine and other supplies for the Mare Island and Puget Sound navy yards.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until June 19 for the following machinery for the New York, Annapolis and Pensacola navy yards: Schedule 562, metal saw; schedule 563, engine lathes, drill press, wood trimmer; schedule 564, trimming press, steam hammer, wood lathes, revolving derrick, centrifugal pump, planer and jointer, band saw, rip and cross cut saw, saw setters, &c.; schedule 565, pipe bender, grinder, drills, &c.

The following bids were opened May 22 for supplies for the navy yards:

Bidder 5, Atlantic Works, Philadelphia, Pa.; 6, Bertsch & Co., Cambridge City, Ind.; 13, Bullard Machine Tool Company, Bridgeport, Conn.; 14, Berger-Carter Company, San Francisco, Cal.; 15, E. W. Bliss Company, Brooklyn, N. Y.; 18, Geo. F. Blake Mfg. Company, New York; 21, F. S. Banks & Co., New York; 33, Chicago Pneumatic Tool Company, New York; 37, James Clark, Jr., & Co., Louisville, Ky.; 42, Drew Machine Agency, Manchester, N. H.; 44, M. T. Davidson, Brooklyn, N. Y.; 46, Thomas H. Dallett Company, Philadelphia, Pa.; 53, J. A. Fay & Eagan Company, New York; 54, The Fairbanks Company, New York; 58, General Electric Company, Schenectady, N. Y.; 71, Handlan-Buck Mfg. Company, St. Louis, Mo.; 74, Ingersoll-Rand Company, New York; 86, Lovekin Pipe Expanding & Flanging Machine Company, Philadelphia, Pa.; 100, Manhattan Supply Company, New York; 104, Manning, Maxwell & Moore, New York; 106, Niagara Machine & Tool Works, Buffalo, N. Y.; 108, Northern Electrical Mfg. Company, Madison, Wis.; 113, Niles-Bement-Pond Company, New York; 120, S. M. Price Machinery Company, Norfolk, Va.; 121, Pratt & Whitney Company, Hartford, Conn.; 124, Platt Iron Works Company, Philadelphia, Pa.; 131, Ricketts Engineering Company, Washington, D. C.; 147, Smith-Courtney Company, Richmond, Va.; 152, George C. Thomas, New York; 157, Van Dyke-Churchill Company, New York; 159, Warren Steam Pump Company, New York; 161, Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa.; 164, C. H. Wheeler Mfg. Company, Philadelphia, Pa.

Schedule No. 524.

Class 21. Two Pneumatic punches—Bidder 33, $800.

Class 22. One back geared engine lathe, with direct connected motor—Bidder 54, $910 and $1180; 104, $885; 113, $887; 131, $920; 147, $1000.

Class 23. One Pond back geared engine lathe, with direct connected motor—Bidder 54, $2235 and $2495; 104, $2600; 113, $2207; 131, $2120.

Class 24. One electrical driven wood lathe—Bidder 5, $1500.

Class 25. Two engine lathes—Bidder 104, $400.50; 113, $1312.

Class 26. Two engine lathes—Bidder 104, $2500; 113, $3184 and $2564; 131, $2700.

Class 27. Two engine lathes—Bidder 104, $2000; 113, $1940; 131, $1890.

Class 30. One molding machine—Bidder 53, $805.

Class 31. One drill press—Bidder 37, $375.

Class 32. One upright drill press, with direct connected motor—Bidder 54, $450 and $475; 104, $445; 131, $525; 147, $449.87.

Class 33. One Perkins forming press—Bidder 147, $2585.

Class 34. One Bullard combination turret machine—Bidder 13, $1426 and $1200; 113, $1127 and $1461.

Class 35. One Bement steam hammer—Bidder 113, $3650.

Class 36. One Pratt & Whitney die sinking machine—Bidder 121, $2600.

Class 37. One Bliss portable inclinable trimming press—Bidder 15, $750; 71, $765; 120, $750; 131, $760; 147, $783.

Class 38. Two portable electric deck planers—Bidder 46, $1044.60.

Class 39. One steel plate gate shear, with direct connected motor—Bidder 6, $2340; 54, $3075; 71, $1700 and $2490; 104, $2650; 113, $1795; 131, $1535.

Class 40. One rotary slitting shear—Bidder 15, $600; 104, $475; 106, $276; 120, $600.

Class 41. One pipe flanging and expanding machine—Bidder 86, $4000.

Class 42. One cold metal sawing machine—Bidder 120, $1450; 157, $1510.

Schedule No. 529.

Class 84. One 12 horse-power and variable speed open type motor—Bidder 58, $555; 108, $675; 161, $697.

Class 90. Two automatic motor hoists—Bidder 14, $478; 74, $490; 152, $555.

Schedule No. 533.

Class 195. One crane and hoist—Bidder 21, $73; 71, $70; 100, $89.40.

Schedule No. 535.

Class 227. Twenty vertical simplex double acting feed pumps—Bidder 18, $880; 42, $1055; 44, $800; 159, $1500.

Class 228. One combined surface condenser and air and circulating pump—Bidder 18, $1085, $1055; 42, $1195, $1239; 44, $1190; 124, $1070; 159, $1024.50; 164, $1080.

The following bids were opened May 18, circular No. 307A, for an engine lathe for the Isthmian Canal Commission:

Baird Machinery Company, Pittsburgh, Pa., $1470, delivery Colon, 110 days.

Fairbanks Company, New York, $1565, delivery Colon, 120 days.

Handlan-Buck Mfg. Company, St. Louis, Mo., $1475, delivery on dock, Colon, 60 days.

R. K. Le Blond Machine Tool Company, Cincinnati, Ohio, $1375, delivery Colon, 75 days.

Manning, Maxwell & Moore, New York, $1450, delivery Colon, 120 days.

Niles-Bement-Pond Company, New York, $1418, delivery Colon, 30 days.

Prentiss Tool & Supply Company, New York, $1345, delivery Colon, six to eight weeks.

C. T. Patterson Company, Limited, New Orleans, La., $1460, delivery Colon, 60 days.

Pittsburg Machine Tool Company, Allegheny, Pa., $1525, delivery Colon, 90 days.

Queen City Supply Company, Cincinnati, Ohio, $1145.46, delivery Colon, 90 days.

The following bids were opened May 21 for supplies for the Isthmian Canal Commission, circular No. 307:

Bidder 2, Alberger Condenser Company, New York; 4, Ashton Valve Company, Boston, Mass.; 7, Becker-Brainard Milling Machine Company, Hyde Park, Mass.; 13, Buffalo Steam Pump Company, Buffalo, N. Y.; 14, A. S. Cameron Steam Pump Works, New York; 25, Fairbanks, Morse & Co., Chicago, Ill.; 27, Fox Bros. & Co., New York; 31, Gardner-Governor Company, Quincy, Ill.; 40, Handlan-Buck Mfg. Company, St. Louis, Mo.; 53, Manning, Maxwell & Moore, New York; 59, Niles-Bement-Pond Company, New York; 68, Platt Iron Works Company, Dayton, Ohio; 82, Vermilye & Power, New York; 84, Woodward, Wight & Co., New Orleans, La.; 87, George F. Blake Mfg. Company, New York.

Class 1. Thirteen engine lathes—Bidder 27, item 1, $639; 53, $10,015.75; 59, $8839; 84, item 1, $673; 2, $830; 4, $2267.50.

Class 2. One milling machine—Bidder 7, $1433; 27, $1351.50; 40, $950; 59, $1450.

Class 4. Four feed water heaters—Bidder 2, $1900; 27, $2916.50; 40, $1850; 82, $2618.

Class 7. Four steam pumps—Bidder 13, $204; 14, $360; 25, $202 and $227; 27, $205; 31, $225; 40, $234; 51, $210; 68, $199.30; 87, $165.48.

Under bids opened April 17 for supplies for the navy yards Manning, Maxwell & Moore, New York, have been awarded class 27, one portable electric drill, $72.

The Electric Launch Company, Bayonne, N. J., has been awarded closs 610, two electric motors, &c., $7976.40, under opening of May 8 for supplies for the navy yards.

Under bids opened May 1 for supplies for the navy yards the Independent Pneumatic Tool Company, Chicago, Ill., has been awarded class 72, ten little giant drills, $677.

Hawkridge Bros., 303 Congress street, Boston, Mass., are no longer agents for the Crucible Steel Company of America, and announce that they have been appointed sole New England agents for the Halcomb Steel Company, Syracuse, N. Y., maker of bars, sheets, forgings, drill rods, wire, strips, rolled sheets and all drawn shapes and sizes. A large stock will be carried and prompt shipments made. In connection with the above, Hawkridge Bros. refer to the fact that about 16 years ago they introduced their Hawk brand tool steel, the mixture of which they control, selling the steel at a fair price, but still high enough to insure the use of the very best materials.

According to the report of State Statistician Joseph H. Stubbs, of Indiana, there were 810 factories in Indianapolis in 1905. Foundries and machine shops led the industries of the city, with nearly $8,000,000 invested out of a total of $53,500,000. There were 54 foundries and machine shops in the city. The report shows 8,207 factories in Indiana, with capital invested in them of $312,071,234.

Trade Publications.

Electric Cranes.—Alliance Machine Company, Alliance, Ohio. Catalogue. Size, 7¾ x 10¾ inches; pages, 48. The company's main product is large conveying and handling machinery, such as electric traveling cranes, electric charging and drawing machines, electric soaking pit cranes, electric strippers, hydraulic machinery, riveters, &c.; rolling mill machinery, steel cars, steam hammers, charging machines and copper conveying machinery. In this catalogue most of the pages are given to large half-tone engravings of notable installations, and a long list is given of cranes already installed, with their location and capacity.

Boiler Tube Cleaners.—Reversible Tube Cleaner Company, 24 Southbridge street, Worcester, Mass. Pamphlet. Explains at some length the merits of the Criss-Cross boiler tube cleaner for fire and water tube boilers. A special form for cleaning guns is also mentioned.

Wood Working Machinery.—The Hobbs Mfg. Company, Worcester, Mass. Catalogue, comprising 31 four-page bulletins. Size, 6 x 9 inches; pages, 132. Opens with a brief historical sketch of the company, with a few introductory remarks bearing upon the wood working machinery industry. This is followed by an index to the various bulletins contained in the catalogue. Bulletin No. 1 deals with double surface endless bed planing machines, sizes 26 and 30 inches; No. 2, with single surface endless bed planing machines, sizes 26 and 30 inches; No. 3, with four-roll double surface planer, 24 x 4 inches; No. 4, with four-roll double and single surface planers and matchers, each 24 x 6 inches; No. 5, with single surface pony planers, sizes 24 x 6 and 28 x 6 inches; No. 6, with single surface pony planers and matchers, sizes 24 x 6 and 28 x 6 inches; No. 7, with variable speed double and single surface planers, each 24 x 8 inches; No. 8, with 12 and 18 inch buzz planers; No. 13, tenon machine; No. 14, double saw bench; No. 15, tipping table saw bench; No. 16, band saw, size 36 inches; No. 17, circular resaw; No. 18, swing cut off saw; No. 19, pivot cut off saw; No. 20, slitting saw table; No. 23, power feed box board matching machine; No. 24, countershaft; No. 25, wooden frame box fitting saws; No. 27, combination saw table; No. 28, foot mortising machine; No. 29, power mortising machine; No. 30, hub mortising machine; Nos. 31 and 32, upright boring machines, Nos. 1 and 2 respectively; No. 34, 11-inch wood turning lathe; No. 35, pattern makers' lathe; No. 36, variable self feed rip sawing machine; No. 37, miter cutting machine; No. 38, dowel machine, and No. 39, automatic knife grinder.

Machine Tools.—Wm. Sellers & Co., Incorporated, 1600 Hamilton street, Philadelphia, Pa. Catalogue. Size, 5½ x 8 inches; pages, 72. Describes a large variety of tools for railroad and machine shop equipment, including high speed traveling and swing cranes, improved turntables for locomotives and cars, testing machines, &c. Descriptions and illustrations of various machine tools, alphabetically arranged, are set forth. These include hydraulic accumulators; bending, bolt and nut machines; boring bars; horizontal and vertical boring machines; cranes; drilling, facing machines; forges; grinding machines; steam hammers; hoisting machines; lathes; milling, mixing, planing machines; presses; punching, shearing, riveting machines; bending rolls; shaping, shearing, slotting, slabbing machines; spacing tables; straightening, testing machines, and railroad turntables.

Paper Box Machinery.—Hobbs Mfg. Company, Worcester, Mass. Catalogue. Size, 5 x 6½ inches. Devotes a few opening pages to a brief historical sketch and a description of the plant. Contains detailed descriptions, illustrations, dimensions and specifications of a great variety of labor saving paper box machinery.

Grinding Machines.—Landis Tool Company, Waynesboro, Pa. Pamphlet. Sets forth some of the features of design and construction of the company's grinding machines. A new and somewhat novel design is shown in the emery wheel carriage traverse speed change device, variation of speed between extremes being obtained by simply shipping a lever, requiring no changing of gearing, clutches or belts. The No. 3 universal grinding machine and the gap grinding machine, both with automatic feeds, are described in detail. Specifications of their dimensions are given.

Lubricating Oils.—A. W. Harris Oil Company, Providence, R. I. Pamphlet. Contains descriptions of the company's various brands of lubricating and other oils, together with illustrations of a number of machines and devices to which their use is particularly adapted. Discussion of the lubrication of certain machines is also given, and the closing pages deal with cable coating, several varieties of grease, belt dressing and floor scourer.

Direct Current Motors.—Sprague Electric Company, 527 West Thirty-fourth street, New York. Bulletin No. 224. Treats of "Type D" direct current motors, which are manufactured in nine different sizes of frames, ranging from 10 to 90 horsepower for standard slow speeds, and from 15 to 105 horse-power for standard moderate speeds. These motors are supplied with either shunt, series or compound windings for use on 115, 230 or 500 volt direct current circuits.

Foundry Molding Machinery.—The E. H. Mumford Company, Seventeenth and Callowhill streets, Philadelphia, Pa.

A small folder showing a view of the company's erecting shop and containing a list of large industrial plants which have purchased machines produced by the company.

Steel Castings.—Columbia Engineering Works, Portland, Ore. Bulletin S-1. Calls attention to the advantages of steel castings, briefly describes the company's steel foundry, and enumerates the purposes for which steel castings can be used to advantage. A number of illustrations show the wide variety of work which the company has handled. Grades of steel castings made include low carbon, mild, high carbon, nickel, manganese, chrome and hammered high carbon steel. It is interesting to know that this plant is the only one of its kind in the Northwest.

Steam Supplies.—George B. Limbert & Co. Chicago, Ill. Catalogue. Gives a compilation of prices and dimensions pertaining to flanged material manufactured by this company, including pipe, valves, fittings, &c., for steam, water and gas, and power plant mains and general cut pipe work for high and low pressure.

Motors and Generators.—National Electric Company, Milwaukee, Wis. Bulletin and mailing card. Bulletin No. 367 contains a description of type NL direct current motors and generators. Mailing card shows a view of a 1000-kw. frequency changer, which was one of a recent order of four.

Gasoline Engines.—Lackawanna Mfg. Company, Spring and Lander streets, Newburgh, N. Y. Catalogue. Size, 6 x 9 inches; pages, 32. Describes the Lackawanna valveless motors, which operate on the improved two-cycle three-port principle. The principal claims for the motors are absence of vibration, extreme simplicity, easy starting and operating qualities, superiority in mechanical construction, lightness as compared to actual horse-power developed, fuel economy and perfect lubrication. The motors are made in sizes of from 1½ to 24 horse-power, and are specially adapted for motor boat and automobile use. In the stationary patterns they are adapted for the driving of electric generators, concrete mixing machines, and for all purposes where light and economical power are required.

Steam Traps and Separators.—John T. Lindstrom, 214 South Third street, Allentown, Pa. Catalogue. Size, 4¾ x 6¾ inches. Contains illustrated descriptions of Lindstrom's Corliss valve steam trap and steam separators. Applications of the separator in steam lines and inside of boilers are made clear in sectional views. A specialty referred to is a portable boring bar for reboring cylinders. In the way of useful information instruction is given for setting Corliss engine valves. Concerning the steam traps and separators a number of testimonial letters are printed and a list of users.

Clutches.—Automatic Clutch Company, Akron, Ohio. Booklet D. Title, "Clutchology." Illustrates and describes in detail an automatic and self adjusting clutch. Its principal claims are for simplicity and compactness, with no toggle joints, links, bolts, nuts, &c. It is particularly recommended for automobile and launch transmissions, or for high speed service, as there is claimed to be no friction or wear when the clutch is disengaged.

Gas Engines.—De La Vergne Machine Company, East 138th street, New York City. Circular. Discusses the economy of gas engines and prime movers, and refers in particular to the Koerting two-cycle double acting gas engine, a description of the features of which is given. The Koerting four-cycle gas engine, especially adapted to operation with suction producer plants, and the Hornsby-Akroyd oil engine, are briefly referred to.

Machine Tools.—Garvin Machine Company, Spring and Varick streets, New York City. Complete illustrated catalogue. Size, 4 x 6 inches; pages, 214. This is a new edition of the company's general catalogue, which embraces a number of new designs brought out since the last general catalogue was issued. The improvements take the form mainly of increased stiffness and power and convenience of operation. The subject matter covers milling machines of all styles and sizes, profilers, screw machines, forming machines, monitor lathes, chucking lathes, tapping machines, drill presses, cutter grinders, hand lathes, spring collers and special machinery. A compact arrangement has been followed, but the descriptions have not been stinted, and all the information likely to be required is given with each tool. Tables and general information are appended.

Water Turbines and Centrifugal Pumps.—I. P. Morris Company, Philadelphia, Pa. Bulletin No. 2. This is a technical bulletin, especially issued in the interest of consulting hydraulic engineers and others desiring information concerning the variation in power and efficiency of a turbine wheel when running at a constant number of revolutions and operating under varying heads of water. Curves are given based on tests made, which are applied to the preliminary design of a 13,500 horse-power wheel. The method of working up the results is explained, so that calculations can easily be made to fit other conditions.

Water Softening.—Wm. B. Scaife & Sons Company, Pittsburgh, Pa. Folder. The cover is a *fac-simile* of a ledger, and the inside contains a reproduction from two pages of a ledger, comparing the cost of operating for six months of a 2000 horse-power boiler plant with and without a water softening and purifying system. The saving amounted to something over 12½ per cent., and exceeded the expectations of the user. The circular is issued to advertise the We-Fu-Go and Scaife water softening and purifying systems.

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HARDWARE

THE Senate Post Office Committee is to be commended for the wisdom of its report, which has just been submitted. The retail merchants of the country, too, are to be congratulated, that not one of the various projects which have been urged upon Congress for the benefit of the catalogue houses is recommended for legislative action. There is no suggestion of the approval of a parcels post; the proposed experiment on a small scale is rejected; the post check system—probably the least objectionable of the projects in question—is not recommended for adoption, and the scheme for the consolidation of third and fourth class matter, after careful consideration, met with decided disapproval. This is a signal victory for the merchants, wholesale and retail, throughout the country. The result is the more significant inasmuch as it appears that the fact that any of these changes was recognized to be in the interest of the catalogue house was an important argument against it. In view of the influence brought to bear on the legislators in Washington by the great houses which would be served by the enactment of the proposed measures, the result is a notable victory. Our Washington correspondent, who presents a clear and full statement of the facts in the case, very justly refers to the manner in which the merchants of the country, so ably represented by the National Retail Hardware Association, responded to the warnings and suggestions given in *The Iron Age*, and communicated with their Senators and Representatives so promptly and effectively that they were made aware of the mischievous character of the proposed legislation. While the immediate danger which threatened commercial interests has thus fortunately been escaped, there will doubtless be need of constant vigilance, for it may be assumed that the efforts will be renewed. Each merchant must see to it that by the energy and efficiency with which he conducts his business the trade which belongs to him is held and his territory protected so far as possible from the inroads of the mail order houses. Meanwhile congratulation is the order of the day.

With the increased attention which is being given by manufacturers and merchants in Hardware and related lines to the cultivation of export trade, the action of the International Postal Congress in increasing the unit of weight of foreign letter postage from one-half ounce to an ounce will be greatly appreciated in business. The saving in expense will be no unimportant item with many houses who have large foreign correspondence, and an annoyance will be eliminated in the unintentional tax of twice the postage due when a letter exceeds the half ounce by even a minute fraction—a matter which has been the cause of not a little irritation with foreign correspondents who are apt to be exceedingly sensitive in the presence of such charge. It is, indeed, no uncommon occurrence with them to decline to accept mail on which postage is due, which means that the letter fails of its purpose and eventually, after its fruitless journey, finds its way back to the sender through the American dead letter office. To keep a business letter within the half ounce means special paper and envelope, which are usually more expensive than ordinary office stationery, while at the same time additional care and labor are involved. The inclosure of printed matter, too, is usually out of the question if the postage is to be kept down to a single 5-cent stamp.

With a full ounce as the unit the American business man or his correspondent abroad need pay little more attention to weights in his foreign letters than he does with his domestic mail. The same stationery will answer and permit also the inclosure of a leaflet or other printed matter of small weight, such as a price-list or circular. Ten cents will carry quite a considerable amount of printed matter. In practice it will be found that the new rule of the Postal Union, as determined by the International Congress, will mean a radical change, the full results of which will only gradually be developed. The volume of correspondence between the United States and other countries has increased to a vast extent during recent years. This must naturally have been the case where our foreign trade has advanced with such tremendous strides. Doubtless, also, the increase in business may to a certain extent be attributed to the greater use of the mails in making known American goods to the foreign buyers. With cheaper postage manufacturers and other exporters will be led into still greater effort in this direction.

It may be said, indeed, that in a certain sense the postal rate has not been reduced, that it still costs 5 cents to send a letter, and that the second and third class rates remain the same. But the business man who has large foreign correspondence knows what the difference will be. He realizes from experience that the full ounce will permit him to use his first-class mail to the best advantage. Doubtless he will be led into the preparation of special trade literature and price-lists to be inclosed with his letters, instead of sending these important adjuncts under separate cover. It is well recognized that the treatment of unsealed mail is frequently summary; that the waste paper basket gets much of it, while a sealed envelope, a first-class letter, receives respectful attention. Business houses will do well to give the new rule of the Postal Union careful thought, with a view of making the most of a very important concession.

Condition of Trade.

The Hardware market continues to be characterized by very satisfactory conditions, unless, indeed, the discomforts and disadvantages which attend exceptional activity be taken into account as a set off against the undeniable and important benefits which result from a large and long continued prosperity. There is with merchants a good deal of difficulty in getting goods promptly, and the labor and friction of business are thus not a little increased. At the same time manufacturers find themselves confronted with perplexities and difficulties of production when their capacity is overtaxed, as they are not infrequently embarrassed by slow deliveries of material, inability to secure competent workmen and the necessity of being obliged to force their plants unduly. That they are not able to meet the requirements of their customers, whose appeals come to them in telegrams and letters, and sometimes, indeed, in personal calls, is a source of real regret, and causes them to make strenuous efforts to serve them with an adequate supply of goods. This large demand, which is the dominant feature of the market, is accompanied by an excellent tone in the matter of prices, and the advance in metals is having its effect on the quotations of various classes of goods. In others it is in-

creasing the cost without advancing the price, as yet. A good deal of Hardware is going to San Francisco for use in rebuilding and to supply the merchants there who are getting into shape for business. From nearly all parts of the country reports indicate prosperous conditions, and the volume of current business is large for the season. Indeed, the falling off in volume which usually occurs about this time has not yet made its appearance to any great extent. Export business is of growing volume, and many manufacturers are pursuing the wise policy of taking care of their foreign trade, notwithstanding the clamor for goods from their customers at home.

Chicago.

Earlier than in former seasons Western Stove manufacturers report heavy shipments, and the measure of prosperity already experienced is indicative of a record breaking year. Last year's sales reached a total never before attained, and the mild weather in some sections resulted in the carrying over of large stocks by retailers, but early shipments to jobbers leads the manufacturers to conclude that general trade conditions will not be materially influenced by these stocks. The output of Western Stove foundries this year will greatly exceed all former records, as the large percentage of existing plants made extensive additions and in instances doubled their output, while the new shops intent upon introducing their product for the first time this year are legion. The heavy trade in all classes of Heaters will naturally come in the fall and its extent will be almost entirely dependent upon the crops. The sale of Oil and Gas Cooks, has, however, been almost unprecedented this season and jobbers' floors are practically barren of stocks. Stove prices, however, despite raw material advances, continue on a comparatively low basis, and it is doubtful if the net profit to the manufacturers, even with record sales, will be as great as during normal conditions, when the cost of manufacture is much lower than to-day. The high ruling quotations of Pig Tin have resulted in advances on Tinned Wire and Copper Sheets, the latter having been advanced from 2½ to 3½ cents a square foot. Brass Screws, with flat heads, have also been increased in price, no advances having been made in this line when round heads were recently placed on a higher basis. The demand for Poultry Netting and Fencing has fallen off considerably, and with the exception of Nails and Wire Cloth Wire products have been seasonably affected. The movement of summer goods is, however, very heavy and jobbers experience a difficulty in keeping full lines in stock.

NOTES ON PRICES.

Wire Nails.—While new business is somewhat lighter, specifications on contract orders result in heavy shipments from mills. A large amount of Nails is being shipped to the Pacific Coast. Some slight irregularities in prices which are here and there reported are apparently the result of low freight rates. Otherwise the market is regarded as very satisfactory and has an excellent tone. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in ten days:

Carloads to jobbers	$1.85
Carload lots to retail merchants	1.90

New York.—During the past week the demand has been moderate and somewhat spasmodic for small lots from store. Reports are to the effect that jobbers' prices are being maintained. Small lots from store are quoted on the basis of $2.15 per keg.

Chicago.—The demand for Nails during the closing month has broken all previous records and shipments are unprecedented, considering the season. Mill stocks are being heavily drawn upon by large distributers and heavy shipments continue to be made to meet San Francisco requirements. The falling off in consumption anticipated by the producers which generally comes at this season has not yet materialized, and from present indications demand will continue heavy through the month of June. Quotations are firm but unchanged, as follows: $2 in car lots to jobbers and $2.05 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—The general market is in fairly satisfactory condition. New orders are somewhat light, as spring demand is over, but shipments by the mills on contracts continue heavy. The mills are sending large quantities of Wire Nails to the Pacific Coast and are giving preference in deliveries on such orders. Prices generally are firm, except to Southern Ohio River points, on which some cutting is being done by mills that have low rates of freight. This, however, does not disturb the general market to any extent, which is quite firm. The recent flurry in prices on Wire Nails to Texas points is over and prices to these points are again being maintained. We quote: Wire Nails, $1.85 in carloads to the large jobbing trade and $1.90 in carloads to retail merchants, f.o.b. Pittsburgh, plus actual freight to point of delivery, terms 60 days, less 2 per cent. off for cash in ten days.

Cut Nails.—At the meeting of the Cut Nail Association, which is being held to-day (Tuesday), it is anticipated that nothing further than reaffirming prices will be done, notwithstanding the quite general concessions of 5 to 10 cents per keg, on carloads and larger lots, from official quotations. Demand is moderate and mills are largely employed in filling contract specifications. Quotations are as follows: $1.75 to $1.80, base, for carload lots, f.o.b. Pittsburgh; $1.85 for less than carloads, f.o.b. Pittsburgh; $1.95 for carload lots, on dock, New York; $2 for less than carloads, on dock, New York. Iron Cut Nails at points west of Buffalo and Pittsburgh are held at 5 to 10 cents advance on Steel Cut Nails.

New York.—Demand is comparatively light, being confined to immediate requirements. No change has been made in jobbers' quotations, which are on the basis of $2.05 per keg.

Chicago.—No change in prices is looked for at the meeting of the Cut Nail Association, which will be held Tuesday of this week. Specifications on contracts continue fairly heavy. Quotations are as follows: Steel Cut Nails in car lots, $1.90 to $1.95; less than car lots, $2; Iron Cut Nails, $2 to $2.05 in car lots; less than car lots, $2.10.

Pittsburgh.—A meeting of the Cut Nail Association is to be held in Pittsburgh to-morrow (Tuesday). Whether the mills will make an official reduction in prices to meet the concessions which have been made for some time is not known at this writing. New orders being placed are small, the mills running mostly on contract specifications. Concessions in prices of Cut Nails of 5 to 10 cents a keg below official prices continue to be made on carloads and larger lots. We quote Cut Nails at $1.75 to $1.80, base, f.o.b. Pittsburgh, for carload lots, and $1.85 in less than carload lots. For Iron Cut Nails an advance of 10 cents per keg is charged.

Barb Wire.—Filling contract specifications, which are quite heavy, makes up most of mill business, as new orders are light. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in ten days:

	Painted.	Galv.
Jobbers, carload lots	$2.00	$2.30
Retailers, carload lots	2.05	2.35
Retailers, less than carload lots	2.15	2.45

Chicago.—The season is practically at an end and the movement of material is limited almost entirely to jobbers' stocks. Quotations are firmly maintained, as follows: To jobbers, Chicago, car lots, Painted, $2.15; Galvanized, $2.45. To retailers, car lots, Painted, $2.20; Galvanized, $2.50. Retailers, less than car lots, Painted, $2.30; Galvanized, $2.60. Staples, Bright, in car lots to jobbers, $2.10; Galvanized, $2.40; car lots to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—New business being placed with the mills is for small lots only, and it is likely that new demand will be quiet until fall. The railroads are specifying

liberally on contracts on which shipments by the mills are quite heavy. Prices on the whole are being maintained, as follows: Painted Barb Wire, $2, and Galvanized, $2.30, in carload lots to the large jobbing trade, with the usual advance of $1 a ton to retailers in carload lots, f.o.b. Pittsburgh, 60 days, or 2 per cent. off for cash in ten days.

Smooth Fence Wire.—Railway and telephone companies are furnishing the larger portion of business, as the Field Fencing demand is over for the season. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent discount for cash in ten days:

Jobbers, carloads	$1.70
Retailers, carloads	1.75

The foregoing prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12&12½	13	14	15	16
Annealed	Base	$0.05	.10	.15	.25	.35	.45	.55
Galvanized	$0.30	.35	.40	.45	.55	.65	1.05	1.15

Chicago.—Heavy sales of Bale Ties are now being made by all the mills, which are operating night and day to meet the demand. No irregularity in prices has been reported in this territory, notwithstanding the reports of shading in some of the Southern competitive districts. As the Field Fence season is practically at an end, mill shipments to manufacturers are very light, although requirements of telephone companies are very heavy and considerably above normal. Prices continue to be well maintained, as follows: To jobbers, $1.85, f.o.b. Chicago, in car lots, and car lots to retailers, $1.90.

Pittsburgh.—The Fence season is over and specifications from Fence manufacturers have practically stopped. Demand from railroad companies continues quite heavy. Prices are being fairly well maintained, but concessions are being made in some cases to southern Ohio River points of delivery. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in ten days:

Jobbers, carloads	$1.70
Retailers, carloads	1.75

The above prices are for base numbers, 6 to 9.

Hemp & Co.'s Patent Lock Stove Pipe.—Hemp & Co., St. Louis, Mo., announce the following revised prices on their Patent Lock Stove Pipe:

	5 inches.	5½ and 6 inches.	7 inches.	7 to 6 inches.
Battle Axe, Blue Smooth Steel	6	6½	7½	8
Double Lock Peerless, Blue Smooth Steel	6¾	7¼	8¼	8¾
Can't Slip, Blue Smooth Steel	6¾	7¼	8¼	8¾
Duplex, Polished Blue Smooth Steel	8¾	9¼	10¼	10¾
Yale, Russia Finish	15¾	16¼	17¼	17¾
Planished Duplex	29½	30½	37	38
Galvano, Galvanized Iron	15	16	17	17½

If the Pipe is wanted made up 1 cent is to be added per joint for Grooved and 1½ cents for Riveted, and an additional charge is made for crating made-up Pipe.

American Screw Company.—Under date May 24, American Screw Company, Providence, R. I., issues a discount sheet quoting revised discounts on Flat Head Brass Wood Screws, and also on Tinned Tinners' Rivets, while at the same time change is made in the net addition for metallic tinning of Rivets or Burrs from 2½ to 3½ cents per pound. These changes both in Screws and Rivets are necessitated by the high prices ruling for copper and tin. The new prices thus announced are as follows:

	discount
Flat Head Brass Screws	82½ and 10 %
Tinners' Rivets, tinned	70 %
Additional charge for metallic tinning Rivets or Burrs, per pound	3½ cents

Wire Picture Cord.—The market for Wire Picture Cord is commanding considerable attention and is thought to be undergoing some sort of readjustment. It is recognized that this line has long been in a chaotic condition, widely diverging quotations being made which could with difficulty be compared because of lack of uniformity in packing. The admission is made that some manufacturers have been putting up Cord that was short length and not up to gauge. Much of this short Cord has also been sold to jobbers, at prices slightly below the market, being made up for them, it is said, at their own instance. It is true that the consumer is rarely particular about an article of this kind, and as a rule never knows whether he gets as much as the label calls for, but this sort of merchandizing is distasteful to the better class of merchants and undoubtedly to the manufacturers as well. The movement now on foot is believed to be directed toward the betterment of these unsatisfactory conditions, in which it is to be hoped that it will be successful.

Chalk and Crayon.—The announcement is made that several independent producers of Chalk and Crayon have been absorbed by the American Crayon Company, which thus secures virtual control of the market. Following the elimination of this competition the American Crayon Company has sent out new printed prices, said to be necessitated by the increased cost of labor and raw material. These prices, which represent important advances on Carpenters' Chalk and Crayon, are as follows:

	Per gross. Cents.
Carpenters' Chalk, white	30
Carpenters' Chalk, red	35
Carpenters' Chalk, blue	40
	Per 100 gross.
White Round Crayons, Sandusky brand	$6.50
White Round Crayons, Waltham brand	6.50
White Round Crayons, Empire brand	6.00
White Round Crayons, Sterling brand	5.50

Cow Bells.—The manufacturers of Cow Bells, owing to the increased cost of raw material, have withdrawn quotations. It is understood that new prices will be announced to go into effect June 1.

Peck, Stow & Wilcox Company.—Peck, Stow & Wilcox Company, Southington, Conn., and 27 Murray street, New York, announces that the cost of articles manufactured by it has greatly increased, owing to the advances in both labor and material, and prices on its products which have been quoted by letter or salesmen are withdrawn.

Eaves Trough and Conductor Pipe.—The market for Eaves Trough and Conductor Pipe is apparently more settled than it has been for a long time and current prices are firmly maintained.

Sheet Copper.—Owing to the high price of Tin, the manufacturers of Sheet Copper on May 24 advanced the price for tinning 1 cent per square foot of surface, or from 2½ cents to 3½ cents per square foot.

Paris Green.—Demand is fair, and, as consuming demand has not yet commenced to any marked degree, is considered satisfactory. Quotations remained unchanged, as follows, on 5 tons and over:

Arsenic kegs	21 c.
Kegs, 100 to 175 pounds	21½c.
Kits, 14, 28 and 56 pounds	22½c.
Paper boxes, 2 and 5 pounds	22½c.
Paper boxes, 1 pound	23 c.
Paper boxes, ½ pound	24 c.
Paper boxes, ¼ pound	25 c.

Terms, 30 days, f.o.b. New York.

The following extras are charged for smaller quantities:

5000 to 10,000 pounds	½c.
1000 to 5000 pounds	1c.
500 to 1000 pounds	1½ to 2c.
Less than 500 pounds	2c. to 3c.

Rope.—The fair demand which has characterized the market for some time continues, and quotations appear to be generally maintained, with the exception, perhaps, of Mixed Sisal Rope. Reports that the low cost of Sisal Hemp is developing some irregularities in Sisal Rope are occasionally heard. Quotations are as follows: Pure Manila, 12½ cents; B quality, 11½ cents; Pure Sisal, 9½ cents; No. 2 quality, 8 cents per pound.

Spring Balances.—Manufacturers of Spring Balances report that the advance of about 10 per cent. declared this month on Circular and Large Dial Balances is regularly maintained, and that the market is in a very satisfactory condition, with business of good volume.

Window Glass.—The plan of closing all Glass factories by June 9 has not met with general favor among manufacturers and the probability is that most of them will endeavor to keep in blast until the end of June.

Many factories have enough orders on their books to keep them employed for another month, and those who are not so well supplied with orders possibly feel that any Glass they may accumulate can be disposed of before the next fire. The recent warm weather has reduced the force in many factories, and the time for closing plants will depend, to a considerable extent, upon the weather. The production of Glass will naturally decrease from this time until the factories close down for the summer. Local demand is light. Jobbers' quotations are as follows: Eastern district, 90 and 10 per cent. discount for all sizes of single and double strength; New York City, 90 and 10 and 5 per cent. discount for all sizes of single and double strength.

Linseed Oil.—Prices of Linseed Oil have been reduced 1 cent per gallon, and demand is quiet. The crushers have more Oil on hand than can be disposed of in the present condition of trade, as the result of anticipating a large spring demand, which has not materalized. The contracts placed during the fall and winter, at from 34 to 37 cents, were heavy, so that large buyers have a surplus of Oil on their hands. Under these conditions there seems to be no probability of an advance in prices in the near future. Quotations are as follows: City Raw, 40 to 41 cents per gallon; out of town Raw, 37 to 38 cents per gallon. Boiled Oil is 1 to 2 cents per gallon advance over Raw.

Spirits Turpentine.—The local market is devoid of interest, and demand is moderate. The uncertainty of future developments in the Southern market is causing buyers to keep their purchases down to actual requirements. Prices have fallen off about ½ cent since last week. New York quotations are unchanged, as follows, according to quantity: Oil Barrels, 60½ to 61 cents; Machine Made Barrels, 61 to 61½ cents per gallon.

HARDWARE CITY TRUST COMPANY.

FOR a number of years the manufacturers of New Britain, Conn., have felt that the banking facilities of the city were altogether too limited, considering the magnitude of their financial transactions. During the past winter several of the manufacturers, headed by the Hon. George W. Corbin, ex-Mayor of New Britain, secured from the State Legislature a charter for a new trust company. Under this charter the Hardware City Trust Company has been formed, the idea of the company being to unite the manufacturers and merchants of the city in the management and to promote both the mercantile and manufacturing interests of New Britain, which occupies a unique position as the Hardware City. The company has formally commenced business and has a capital of $100,000, with surplus of $50,000. The officers and directors of the company, who are among the leading manufacturers and merchants of New Britain, are as follows: Charles M. Jarvis, American Hardware Corporation, president; George P. Hart, the Stanley Works, vice-president; F. G. Vibberts, Manchester Trust & Safe Deposit Company, Manchester, Conn., secretary and treasurer. Directors: Charles M. Jarvis; C. J. Parker, the Parker Shirt Company; H. C. Noble, North & Judd Mfg. Company; F. G. Vibberts; George P. Hart, the Stanley Works; N. P. Cooley, Hart & Cooley Company; Howard S. Hart, the Russell & Erwin Mfg. Company; Charles F. Smith, Landers, Frary & Clark; George W. Corbin, the Corbin Cabinet Lock Company; C. A. Earl, Corbin Screw Corporation; B. A. Hawley, Russell & Erwin Mfg. Company; Charles H. Parsons, P. & F. Corbin; George L. Damon, D. A. Niven, and J. E. Cooper.

THE WARNER HARDWARE COMPANY, Minneapolis, Minn., is erecting a new building which when completed will cost $85,000. It will be five stories high and 53 x 145 feet in dimensions. The building will be of reinforced concrete construction, the exterior being of brown brick trimmed with terra cotta. Electric passenger and freight elevators will be installed. The work of construction will be completed in the early fall.

BRIDGEPORT HARDWARE MFG. COMPANY.

THE BRIDGEPORT HARDWARE MFG. COMPANY, Bridgeport, Conn., manufacturer of Hardware and Cutlery specialties, has increased its capital stock from $75,000 to $125,000, the new capital to be devoted to the expansion of the business. The company has been increasing its facilities in its new plant to take care of a growing business in its line of Hardware specialties, including Nail Pullers, Screw Drivers, Cutting Nippers, Hack Saws and Frames. Within the past month the company has absorbed the entire business of the Perfect Sliding Door Company, Bridgeport, and has started the manufacture of the Sliding Doors formerly manufactured by that company. The Perfect Sliding Door, which has been described in these columns, has been developed to a point to lead the new owners to anticipate a large and increasing demand, and consequently the sales end of this branch of the business is being developed to cover the entire United States and Canada. The new factory building has ample space to permit of almost doubling the company's business, rapid growth having been anticipated when it was erected.

MEETING OF SOUTH CAROLINA MERCHANTS

AS has already been noted, the South Carolina Retail Hardware Association will hold its second annual meeting at Wright's Hotel, Columbia, on June 12, 13 and 14. The railroads have granted a reduced rate of a fare and a third on the certificate plan from all points in North and South Carolina and Virginia. It is hoped to interest merchants in North Carolina and Virginia in the association, with a view to increasing its influence and usefulness and making it representative of the retail Hardware interests of the three States. Preparations have been made for a very interesting convention and a large attendance is promised. The advisability of forming a mutual fire insurance company on the lines so successfully and profitably carried out by Hardware associations in other States will be discussed, and efforts will be made to get one under way in this section of the country. The association's "Year Book," containing the programme of the meeting, will be mailed about June 1.

TRADE ITEMS.

A RECENT addition to the line of Coes Wrench Company, Worcester, Mass., brings up the assortment of sizes of its Key Wrenches to a range of from 6 to 48 inches. Although already well known for the excellence of its product and recognized as the leading manufacturer in this line, the company refers with pride to the fact that the 6-inch Wrench has the same attention to detail, the same stock and the same finish as the larger sizes, while the 48-inch is just as well adjusted as the tool made for one hand to use.

NEWHALL SHIP CHANDLERY COMPANY, 186 Front street, New York, has recently increased its productive capacity by moving its manufacturing plant from the above address to a more suitable one in Jersey City, N. J. This company manufactures principally Ship and Awning Hardware and carries a full line of that class of material, including Tackle Blocks and Sheaves.

THE NEW YORK METAL CEILING COMPANY, 537-541 West Twenty-fourth street, New York, has decided to double the size of its plant. This business was started on a very modest scale about 16 years ago, and has outgrown the 30,000 square feet of floor space now occupied. The company has increased its capital by the issue of $200,000 of 8 per cent. preferred stock.

ELWOOD LAWN MOWER MFG. COMPANY, Elwood, Ind., has taken over the plant of the Elwood Lawn Mower Company and will continue the making of this line. New patterns for next season are now being prepared, and will be ready for presentation to the trade by August 1.

J. STEVENS ARMS & TOOL COMPANY, Chicopee Falls, Mass., has lately issued an unusually attractive hanger, in which attention is effectively directed to the quality and merit of the company's Fire Arms.

Defeat for Parcels Post And Kindred Projects.

FROM OUR SPECIAL WASHINGTON CORRESPONDENT.

WASHINGTON, D. C., May 29, 1906.

THE Senate Post Office Committee, after a month's consideration, has reported the annual post office appropriation bill without the addition of a single amendment in the interest of the catalogue houses. This is a great victory for the retail Hardware merchants of the country, who have responded in the most effective fashion to the suggestions made in *The Iron Age* from time to time concerning the dangers impending at the various stages in the consideration of this important measure. The national organization of the Hardware retailers has done splendid work in the campaign, and every step taken by the so-called postal reformers has been closely observed and promptly met by vigorous protests from all parts of the country.

Parcels Post Beaten Early.

When the Senate committee took up the appropriation bill, three important propositions of great value to the catalogue houses were urged as "riders." First, a parcels post plan; second, a post check system, and, third, the consolidation of third and fourth class mail matter, by which the rate on merchandise would be reduced from 16 to 8 cents per pound. The advocates of a parcels post suggested an alternative in the form of an experimental measure, such as was urged in the last Congress by Representative Denny of Maryland, and for which an appropriation of $100,000 was sought. The committee was opposed to the parcels post project from the outset and little time was wasted in its consideration. The retail merchants were accurately advised of the situation respecting the parcels post, and expended very little ammunition upon it.

The Post Check Scheme

however, was energetically pushed by a big bureau of ex-post office officials maintained here at great expense by the patentee of the so-called post check currency. As already reported in this correspondence, the committee gave Mr. Post and his assistants an extended hearing. In addition, the Postmaster-General presented the outline of a substitute bill for a system of fractional currency, and strongly urged it upon the attention of both houses. Such disclosures were made at the hearing, however, that the committee concluded that the proposition had no place on the Appropriation bill and ought not to be adopted except after a much more thorough investigation than could be given it at this advanced stage of the session.

The Consolidation Project

met a similar fate. This scheme for cutting the postage bills of the catalogue houses in half was originally brought forward by Third Assistant Postmaster-General Madden four years ago and has been urged by him ever since in his annual reports. The plan received considerable strength in certain quarters, from the fact that the Postmaster-General put it forward as a method of silencing the demand for a domestic parcels post. Among the great majority of members of the Senate and House, however, the fact that the consolidation project was desired by the parcels post boomers and was regarded by the officials as a move in that direction was sufficient to condemn it, and the Senate committee after careful consideration rejected it.

Some Important Amendments.

While the post office appropriation bill has therefore been reported to the Senate free and clear of all catalogue house provisions, it nevertheless contains a number of amendments of the highest importance to the retail merchant. For several years there has been a demand on the part of rural carriers for a law permitting them to engage in private work during their leisure hours, their object being to secure permission to act as the agents of the catalogue houses. These big concerns have surreptitiously subsidized the carriers in every conceivable manner and the postal authorities have been obliged to threaten them with prosecutions to compel them to desist. The Senate committee has decided that the most satisfactory method of meeting the situation is to grant the carriers 15 days' leave of absence with pay annually and then to hold them strictly to the letter of the law and regulations prohibiting them from engaging in any other employment. The amendment as reported by the Senate committee is as follows:

> Provided further, That rural letter carriers after 12 months' service be allowed annual leave, with pay, not to exceed 15 days; the substitutes for carriers on vacation to be paid during said service at the rate of $600 per annum.

To provide for the expense involved in granting leave of absence to upward of 30,000 carriers, the Senate committee has raised the appropriation for the rural free delivery service from $28,200,000 to $28,700,000. It is probable that the half million dollars thus added to the bill will be found inadequate, but, if so, a deficiency appropriation will be made next winter.

With a View to Reducing the Present Postal Deficit and to put the service on a self supporting basis the Senate committee, which believes that there will always be more or less agitation of catalogue house legislation as long as the receipts fail to meet the expenditures, has adopted two important provisions, namely, the creation of a commission to investigate second class mail abuses and especially the circulation of mail order house organs, and the adoption of a regulation requiring that postal supplies, furniture and general merchandise, which the Government now sends through the mails under official franks, shall hereafter go by freight at much lower rates.

The Senate Committee as well as the officials of the Post Office Department believe that matter now admitted to the mails at second-class rates should be reclassified so that newspapers, trade papers, &c., disseminating news matter and commercial intelligence shall be sent at the present publishers' rate of 1 cent per pound, while purely literary matter, house organs, &c., shall pay the higher rates. The officials are of the opinion that there are many house organs now enjoying the publishers' rate which are printed solely as advertising mediums.

One of the Abuses

which has aided in swelling the deficit for several years past has been the shipment of large quantities of merchandise, including furniture, and postal supplies of all kinds as mail matter under official franks. Not only has this resulted in the payment of large sums to the railroads for the carriage of this matter in mail cars, but there is reason to believe that large quantities have been shipped during the periods when the daily mails are weighed for the purpose of determining the average of the railway mail pay, the result being that the Government has paid the railroads much larger sums than have actually been earned. The Senate Committee now proposes that all this matter shall go by freight wherever practicable.

There is a single feature of the bill which, while it need not occasion any immediate alarm, should nevertheless have the very careful attention of the retailers of the country. It is a provision authorizing an

Investigation of Foreign Postal Systems,

and while there is no indication that the purpose of the department in urging this amendment, or of the committee in adopting it, is any way sinister, nevertheless it is difficult for the average man who is engaged in fighting the catalogue house to avoid a slight suspicion that an investigation of foreign postal systems may impress certain superficial postal "experts" with the advisability of experimenting in this country with a domestic parcels post.

It is stated at the Post Office Department that this provision has been inserted in the bill with a view to enabling the officials to make a very thorough investigation of foreign methods of transportation, classification, accounts, &c., and there is no purpose of introducing the parcels post, although it is conceded that the commission will examine the workings of that institution in Great Britain and elsewhere if the amendment is adopted by the Senate and accepted by the House. In this connection it may be said that a single objection on the floor of the Senate will result in striking out the amendment, and there is reason to believe that the House, which is developing a strong prejudice against the wholesale appointment of commissions, may decline to concur in a provision which is believed in some quarters to have no other purpose than the authorization of a European junket for three postal officials at the expense of the taxpayers.

W. L. C.

The Iron Age Directory.

THE tenth annual edition of THE IRON AGE DIRECTORY is now in process of distribution to the host of subscribers to *The Iron Age* in all parts of the world, every subscriber being entitled to a copy, without charge. This directory, as the trade is aware, is a classified index of all the goods manufactured by advertisers in *The Iron Age*. Some idea of its value and scope may be gained from the fact that the products of more than 1400 manufacturers, including houses large and small, are classified fully and accurately in its pages. The tenth edition is the most comprehensive and complete yet issued, a greater number of manufacturers being represented than ever before, with a corresponding expansion in the classification of products, there being nearly 8200 separate headings and cross references. The space in the directory actually devoted to manufacturers and their manufactures now aggregates 311 pages, one of which is reproduced herewith, to show the compact yet clear typographical arrangement. The trade will doubtless welcome this useful, convenient and elaborate compilation of data in regard to Hardware and related manufactures.

The Iron Age Directory 301

Vises, Milling Machine and Planer—
Bicknell Mfg. & Supply Co., Janesville, Wis.
Brown & Sharpe Mfg. Co., Providence, R. I.
Fairbanks Co., 416 Broome St., New York.
Fox Machine Co., Grand Rapids, Mich.
Gould & Eberhardt, Newark, N. J.
Hendey Machine Co., Torrington, Ct.
Hill-Standard Mfg. Co., Anderson, Ind.
Hollands Mfg. Co., Erie, Pa.
Niles-Bement-Pond Co., 111 Broadway, New York.
Potter & Johnston Machine Co., Pawtucket, R. I.
Pratt & Whitney Co., Hartford, Ct.
Vanderbeek Tool Works, Hartford, Ct.
Williamson Mfg. Co., Bradford, Pa.

Vises, Parallel—
Athol Machine Co., Athol, Mass.
Bignall & Keeler Mfg. Co., Edwardsville, Ill.
Bonney Vise & Tool Works, 3011-3015 Chestnut St., Philadelphia, Pa.
Columbian Hardware Co., Cleveland, O.
Eagle Anvil Works, Trenton, N. J.
Emmert Mfg. Co., Waynesboro, Pa.
Helwig Mfg. Co., St. Paul, Minn.
Hollands Mfg. Co., Erie, Pa.
Howard Iron Works, Buffalo, N. Y.
Merrill Bros., Brooklyn, N. Y.
Millers Falls Co., 28 Warren St., N. Y.
Chas. Parker Co., Meriden, Ct.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Prentiss Vise Co., 44 Barclay St., N. Y.
Tower & Lyon Co., 95 Chambers St., New York.
Williamson Mfg. Co., Bradford, Pa.

Vises, Pin—
(See Vises, Hand or Pin.)

Vises, Pipe—
Bignall & Keeler Mfg. Co., Edwardsville, Ind.
Bonney Vise & Tool Works, 3011-3015 Chestnut St., Philadelphia, Pa.
Butterfield & Co., Derby Line, Vt.
Curtis & Curtis Co., Bridgeport, Ct.
Emmert Mfg. Co. Waynesboro, Pa.
Exeter Machine Works, Exeter, N. H.
A. L. Henderer's Sons, Wilmington, Del.
Hollands Mfg. Co., Erie, Pa.
Howard Iron Works, Buffalo, N. Y.
Humphryes Mfg. Co., Mansfield, O.
Jarecki Mfg. Co., Erie, Pa.
Chas. Parker Co., Meriden, Ct.
J. E. Porter Co., Ottawa, Ill.
Prentiss Vise Co., 44 Barclay St., N. Y.
D. Saunders' Sons, Yonkers, N. Y.
Tower & Lyon Co., 95 Chambers St., New York.
Vanderman Plumbing & Heating Co., Willimantic, Ct.
Walworth Mfg. Co., Boston, Mass.
J. H. Williams & Co., Brooklyn, N. Y.
Williamson Mfg. Co., Bradford, Pa.

Vises, Pipe and Bench, Combination—
Bonney Vise & Tool Works, 3011-3015 Chestnut St., Philadelphia, Pa.

Vises, Saw Filers'—
E. C. Atkins & Co., Indianapolis, Ind.
Bonney Vise & Tool Works, 3011-3015 Chestnut St., Philadelphia, Pa.
Henry Disston & Sons, Philadelphia, Pa.
C. E. Jennings & Co., 42 Murray St., New York.
Oliver Machinery Co., Grand Rapids, Mich.
Chas. Parker Co., Meriden, Ct.
Rock River Mfg. Co., Dixon, Ill.
Schreiber & Conchar Mfg. Co., Dubuque, Ia.
Seneca Falls Mfg. Co., Seneca Falls, N. Y.
Simonds Mfg. Co., Fitchburg, Mass.

Vises, Solid Box—
Columbian Hardware Co., Cleveland, O.
Prentiss Vise Co., 44 Barclay St., N. Y.
Tower & Lyon Co., 95 Chambers St., New York.

Vises, Tubing, Polished—
Hollands Mfg. Co., Erie, Pa.
Vanderman Plumbing & Heating Co., Willimantic, Ct.

Vises, Woodworkers'—
Athol Machine Co., Athol, Mass.
Barbour-Stockwell Co., Cambridgeport, Mass.
Columbian Hardware Co., Cleveland, O.
Emmert Mfg. Co., Waynesboro, Pa.
Fox Machine Co., Grand Rapids, Mich.
Hollands Mfg. Co., Erie, Pa.
Oliver Machinery Co. Grand Rapids, Mich.
Prentiss Vise Co., 44 Barclay St., N. Y.
Wyman & Gordon, Worcester, Mass.

Volt Meters—
(See Meters, Recording Volt.)

Wads, Gun—
Union Metallic Cartridge Co., Bridgeport, Ct.

Waffle Irons—
(See Irons, Waffle.)

Waging Wire—
(See Wire Pointing.)

Wagon and Carriage Machinery—
National Machinery Co., Tiffin, O.
Williams, White & Co., Moline, Ill.

Wagon Axles, Chains, &c.—
(See Axles, Chains, &c.)

Wagons, Boys'—
Hill-Standard Mfg. Co., Anderson, Ind.

Wagons, Delivery—
Sycamore Wagon Works, Sycamore, Ill.
Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

Wagons, Dump—
Kilbourne & Jacobs Mfg. Co., Columbus, O.

Wagons, Live Stock—
Sycamore Wagon Works, Sycamore, Ill.

Wagons, Mill—
Chase Foundry & Mfg. Co., Columbus, O.
Jackson Mfg. Co., Harrisburg, Pa.
Kilbourne & Jacobs Mfg. Co., Columbus, O.

Waist Hangers—
(See Hangers, Garment and Trouser.)

Waiters, Dumb—
Energy Elevator Co., 408 Cherry St., Philadelphia, Pa.
Grant Mfg. & Machine Co., Bridgeport, Ct.
Morse, Williams & Co., Philadelphia, Pa.
Sidney Elevator Mfg. Co., Sidney, O.
J. G. Speidel, Reading, Pa.
Storm Mfg. Co., Newark, N. J.
Warner Elevator Mfg. Co., Cincinnati, O.
Warsaw Elevator Co., Warsaw, N. Y.

Waiters, Silver Plated—
International Silver Co., 9-13 Maiden Lane, New York.

A Page from The Iron Age Directory of 1906.

THE new plant of the Capitol Lock-Nut & Washer Company, Columbus, Ohio, has been completed, and is equipped with the most modern machinery obtainable for the manufacture of Nuts, Track and Machine Bolts, Structural Rivets, Washers and the Gaines Automatic Lock Nut, which is referred to as one of the most simple and positive nut locks on the market. It consists merely of a washer with a tongue stamped in, which protrudes above its surface and catches in ratchets pressed in face of nut. T. H. Ryan is president of the company, and A. M. Gaines vice-president and general manager.

SAN FRANCISCO HARDWARE NOTES.

THE PALACE HARDWARE COMPANY is now located at 456 Golden Gate avenue, San Francisco. This is a fine new store, of which the company expected to be in full possession not later than Monday, May 28. The company had been established in temporary quarters at 942 Magnolia street, Oakland, Cal.

Meyer, Wilson & Co. have reestablished themselves at 2030 Lyon street, San Francisco. They state that most houses, their own included, are preparing to move down town again, as quickly as possible. This firm suffered very little by earthquake and conflagration and fully appreciates its good fortune.

Edwin Jones, for 21 years with Osborn & Alexander, San Francisco, and later with Alexander Yost Company, the last five years as general manager, has disposed of his interest in that house and is starting a new business in the same line, at 1466 Market street. Mr. Jones will appreciate catalogues and quotations from manufacturers at this address.

S. W. Pierce has purchased the interest of D. C. Marbut in the Monett Hardware Company, Monett, Mo.

The Hardware Store of Neal & Brinker Company.

NINTH ARTICLE.

READERS of the previous articles of this series have doubtless observed that a principle kept prominently in mind in arranging the stock of Neal & Brinker Company is that all goods on view should have, as far as possible, the same appearance and set-up as in actual use. This is a great convenience to buyers, especially transients who are not in the habit of purchasing Hardware and may require articles which are little more than a name to them and the varieties of which are entirely unknown. In many cases, of course, the application of

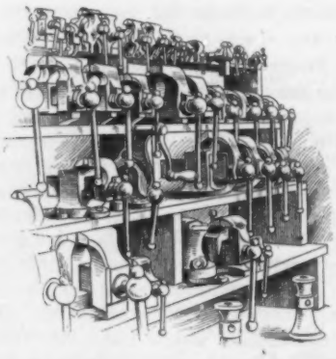


Fig. 58.—Rack Built to Accommodate Vises.—The Different Designs Are Set Up in Groups Graduated According to Size.

this principle of showing goods is not a difficult matter. With some lines, however, considerable study is necessary and special fixtures have to be built to accommodate them. Fig. 58 shows a substantial rack on the main floor supporting a large line of Vises. The rack is about 7 feet long by 4 feet high, and is constructed of 1¾-inch planks, with the exception of the top shelf, holding the smaller Vises, which is a 1-inch board. Each of the four sections of the rack is about 1 foot high. The different designs of Vises are set up in groups graduated

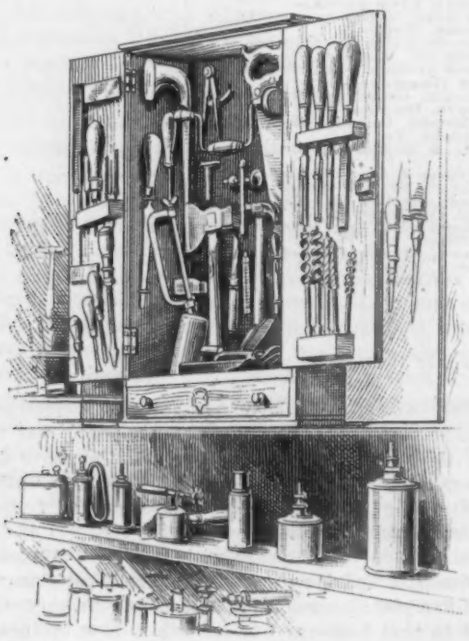


Fig. 59.—Tool Cabinet Standing Open on Counter.—Blow Torches on Bracket Shelves Below.

according to size, the heavier styles occupying the lower shelves. The cut also shows some samples of Jack Screws, which are set up on the floor at the base of the rack.

In Fig. 59 is indicated the method of displaying Tool Chests and Cabinets, several of which are arranged on a counter with doors swung open, showing the entire assortment of Tools which each contains. It goes without saying that outfits thus displayed are much more effective and better calculated to sell than if stacked up with

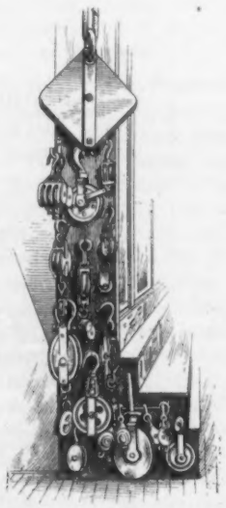


Fig. 60.—Samples of Pulley Blocks on the End of Wall Case, Basement Stairway at the Left.

doors or covers closed, as is the case in many stores. Fig. 59 also shows a couple of shelves supported by brackets on the side of the counter, on which are arranged samples of Plumbers' and Painters' Blow Torches. The wookwork is covered with dark green cloth to increase the effectiveness of the display. Plumbers' Furnaces occupy similar shelves adjoining those shown in the illustration.

The stock of Pulley Blocks carried by Neal & Brinker

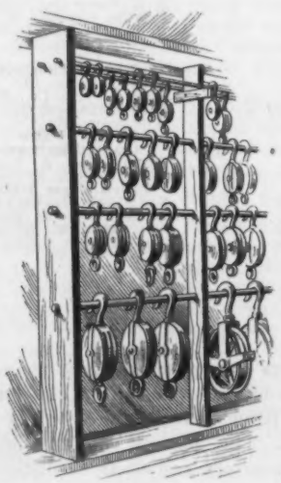


Fig. 61.—Section of Rack in Subcellar Accommodating Blocks.

Company is very large and includes an almost unlimited variety. Samples of Blocks, Fig. 60, are displayed on the main floor, occupying the end of a wall case described in a previous article. They are hung from hooks or screw eyes into which their own hooks are inserted, although in some cases the latter are too large to fit and loops comprising several turns of wire are made to connect the hooks of the Blocks with the screw eyes in the wall. The stock of Pulley Blocks is kept in racks in the subcellar,

Fig. 61, extending nearly half way round the wall space, as will be observed from the plan given in Fig. 62. The

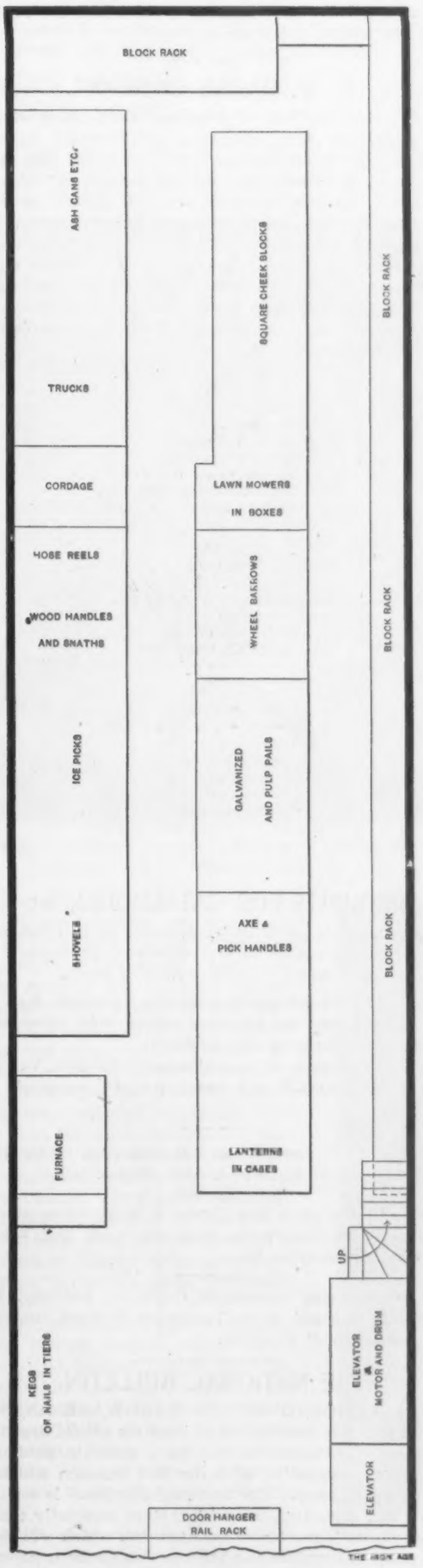


Fig. 62.—Plan of subcellar.

frame of rack is made of thick planks and the Blocks are hung on lengths of wrought iron pipe running as large as 2 inches in diameter in the lower tiers, on which the heavier Blocks are hung. As a rule, the lengths of pipe run through holes bored in the uprights of the frame, but in the case of the upper tier, where lighter Blocks are hung, there are two lengths of smaller pipe which run on either side of the uprights, being supported by cross bars, as shown in the cut. Large square cheek Blocks are not hung on the racks, but are laid close together on edge on broad shelves built up from the floor in the rear of the subcellar, their location being indicated in Fig. 62.

(To be continued.)

AUSTRALIAN NOTES.

FROM A SPECIAL CORRESPONDENT.

MELBOURNE, April 19, 1906.

THE Hardware trade here is experiencing somewhat increased business of late. The country has had good rainfalls and farmers are rejoicing accordingly and ordering freely in Farm Implements and Fencing materials. Building is active alike in the chief cities of the Commonwealth and in the country towns, and this section of the Hardware trade is in an eminently satisfactory state, with every prospect of continuing so.

Harvest returns for the season 1905-1906 are not yet in, but there is no doubt the figures will be among the biggest we have yet seen. The country is being laid under greater area of production every year, and Australia would "boom" could she only secure a good class of immigrants.

The International Harvester Company continues to thrive in spite of all the hard things said about its methods by local manufacturers. Still, there can be no doubt that increased duties will sooner or later be put on American (or other) importations of Harvesters and farmers' Implements generally. This desirable action would have been taken long ago in any live country. But Australian Parliaments consist generally of office seeking men, eager for the appointments of "Royal Commissions," with consequent emoluments, and possessing the highest form of ability in the art of prolonging inquiries, while local industries languish.

The picnic season has just been with us, and a big proportion of the wholesale houses have had their annual outing. The Victorian Hardware Assistants' Association held its annual outing some weeks ago, and with wives and families the attendance totaled about 1500. This association is thoroughly alive in every way and has done much to promote the advancement of its members.

Rabbitproof Wire Netting is in extensive demand throughout Australia, and unfortunately will be a heavy and steady requirement for some years to come. New South Wales alone has erected to date over 40,000 miles of this Fencing.

BELKNAP HARDWARE & MFG. COMPANY.

THE annual meeting of the stockholders of the Belknap Hardware & Mfg. Company, Louisville, Ky., was held on the 24th inst. The following officers and directors were elected: William R. Belknap, president; Morris B. Belknap, vice-president; William Heyburn, vice-president; John W. Price, vice-president; Richard I. James, secretary; Harry S. Perkins, treasurer; M. R. Porter, assistant secretary; A. D. Allen assistant treasurer. Directors, William R. Belknap, Morris B. Belknap, William Heyburn, John W. Price, R. I. James, Harry S. Perkins, Arthur D. Allen, M. R. Porter, Charles W. Allen. Reports showed that the company had spent approximately $400,000 during the past fiscal year for new buildings and improvements. The plant now consists of eight buildings with about 1,000,000 square feet of floor space. Underground tubes connect all the buildings, and 65 telephone stations are in use.

ONEIDA COMMUNITY, Oneida, N. Y., has acquired an interest in the Animal Trap Company, Lititz, Pa. F. W. Shultz retains his interest in the latter company, and will continue as manager. The business will be continued along the same lines as formerly, with, of course, the benefit of the experience and advice of the Oneida Company.

AMONG THE HARDWARE TRADE.

The style of the S. J. Stebbins Hardware Company, Chicago, has been changed to the Stebbins Hardware Company and the capital stock increased from $75,000 to $150,000.

George Brown has succeeded Brown & Garrison, Hardware, Implements and General Store, at Asotin, Wash.

The Winchester Hardware Company, Winchester, Wash., is building a 30 x 60 foot addition to its store, to be used for Implements.

The Olson-Cowan Implement Company, Walla Walla, Wash., was recently incorporated, with a capital of $10,000.

Henry Herboth has succeeded to the Implement and Hardware business of Bernard Jacobs at Uniontown, Wash.

J. W. Johnson of Oakesdale, Wash., has merged his stock of Implements and Hardware with the general stock of F. C. Davidson at Oakesdale. The new firm is styled Davidson & Johnson.

The Hardware firm of Ackerman, Jepson & Co., Titusville, Pa., has recently dissolved. E. H. Williams has retired, and the business will be continued at the old stand under the style of Ackerman & Jepson.

The partnership of Myers & Dawes, Tahlequah, Ind. Ter., has been dissolved, Mr. Dawes' interest having been bought by Louis Myers, who will continue the business.

C. H. Edmands, a veteran merchant of Springfield, Ill, who has been in the Hardware business for more than 50 years, has sold his store and stock. On May 1 his son, F. E. Edmands, will open up in a new building with a new stock of Stoves and Tinware.

S. F. Brown, Oxnard, Cal., has sold his Hardware, Stove and Paint business to Oxnard Furniture & Plumbing Company, composed of F. A. Borchard, R. D. Snively and R. B. Witman.

Andrew Klein has sold his Hardware business in Bradshaw, Neb., to C. L. Smith Company.

The Hardware and Saddlery business of J. W. Gull, Hayes Center, Neb., has been bought by R. E. Counce & Co.

W. C. Dorsey, Louisville, Neb., has been succeeded in the Hardware and furniture business by Dorsey & Lohnes.

F. E. Schmidt Hardware Company has been incorporated to conduct a Hardware, Implement and Plumbing business at Gillespie, Ill.

Floyd Buchanan has bought the Hardware business of Gray & Magner, Silver Creek, Neb.

J. C. Elliott & Co., Mulhall, Okla., have incorporated under the name of Beaver Valley Hardware & Implement Company.

Gibbs & Stout, Enid, Okla., have been succeeded by Gibbs & Shaklee, who will continue the Hardware, Stove, Paint and Sporting Goods business on an enlarged scale.

Joseph Wright has sold his Hardware, Stove, Paint and Sporting Goods store in Wilcox, Neb., to David Wedean.

C. P. Portrum has purchased the Hardware and Furniture store of L. Harris, Pittsburg, Kan.

J. C. Lewis Company, Antigo, Wis., has moved into new and more commodious quarters near its old location, which it has occupied for nearly 23 years. The company has disposed of its Implement and Vehicle business and will give its entire attention to Hardware, &c.

Farwell Bros. have purchased the Hardware business of W. H. Elliott, Little River, Kan.

C. W. GAUSE COMPANY.

C. W. GAUSE, late of Dunham, Carrigan & Hayden Company, San Francisco, and formerly with the Simmons Hardware Company, St. Louis, has just organized the C. W. Gause Company, the business of which will be that of factors in Hardware and kindred products, for domestic and export trade, in San Francisco. The company has a temporary office at 314 San Pablo avenue, Oakland. The company announces its entrance on the field in a postal card in which the cable address is given as "Keep-a-Goin'," and quote the following lines, with an added stanza characteristic of San Francisco's courage and resourcefulness:

EARTHQUAKE PHILOSOPHY.

I.

"If you strike a thorn or rose,
Keep-a-goin'.
If it hails or if it snows,
Keep-a-goin'.
'Tain't no use to sit and whine
When the fish ain't on your line,
Bait your hook and keep a tryin'—
Keep-a-goin'.

II.

"When the weather kills your crops,
Keep-a-goin'.
When you tumble from the top,
Keep-a-goin'.
S'pose you're out of every dime,
Gettin' broke ain't any crime,
Tell the world you're feelin' fine—
Keep-a-goin'."

III.

If a fakir predicts a quake,
Keep-a-goin'.
And if Mother Earth does shake,
Keep-a-goin'.
'Tain't no use to whine and cry
If your trade is knocked sky high,
We'll stick to 'Frisco, you and I—
Keep-a-goin'.

REQUESTS FOR CATALOGUES, &c.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM TAYLOR & WILSON COMPANY, Norfolk, Va., dealers in blacksmiths' and coach makers' supplies, iron, steel, &c.

FROM W. HATFIELD, who has succeeded to the Hardware business of Hatfield & Aten, Ragen, Neb.

FROM HAMANN & SON, Leshara, Neb., whose stock of Hardware, Stoves, Paints, Sporting Goods and Vehicles has been damaged by fire.

FROM PEABODY HARDWARE COMPANY, Peabody, Kan., which has engaged in the Hardware business, under the management of C. C. Carey.

THE NATIONAL BULLETIN.

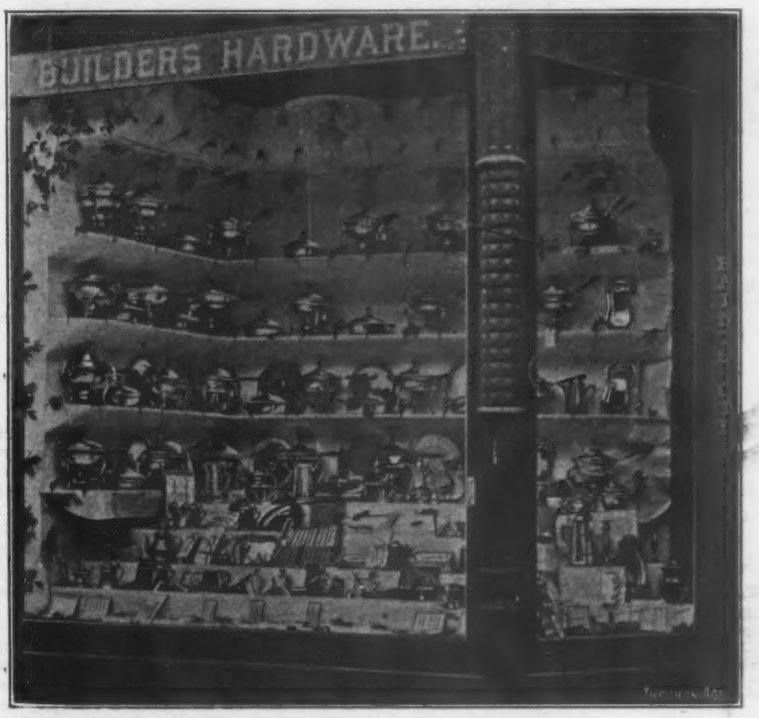
THE NATIONAL RETAIL HARDWARE ASSOCIATION has determined to issue its official organ, the *National Hardware Bulletin*, as a monthly publication hereafter, commencing with the May number, which has just come to hand. The first monthly issue is an interesting and attractive one, with matter, especially that relating to catalogue house competitions, which will doubtless prove entertaining and instructive to the members of the association ,and should prove a valuable aid in carrying out its plans. The *Bulletin* is published as heretofore from Argos, Ind., the residence of M. L. Corey, the efficient secretary of the association.

TRADE WINNING METHODS.

This department is for the description of approved methods of carrying on and extending business, and a cordial invitation is given to merchants to co-operate in the effort to make it suggestive and of practical use to the trade.

CROWDED DISPLAYS THAT SOLD GOODS.

THE accompanying illustrations are of two window displays made simultaneously by the Springfield Hardware Company, Springfield, Ohio. These exhibits



Springfield Hardware Company's Window of Chafing Dishes, Steins, Table and Pocket Cutlery, &c.

were productive of many sales, as the firm's windows usually are, much care being given to this method of securing the attention of the public. Some may perhaps criticise the windows as containing too many goods, yet they were selling windows intended to do their own talking, and they brought results—and very satisfactory ones, too. Sales were made direct from the window, and no articles were replaced during the week of the sale, which of itself was a good advertisement, the steadily diminishing stock suggesting to the observer some thought such as "these goods are going; I had better buy now." At the end of the week both windows were practically bare of goods. Every article shown had the price marked in plain and easily read figures.

One of the windows showed Chafing Dishes, Baking Dishes, Bread Boats, Waiters, Old English Copper and Pewter Steins, Pitchers and Tankards, Coffee Percolators, Candlesticks, Scissor and Razor Sets, Safety Razor Sets, Manicure Sets, Fancy Pocket Knives and Cases, Nut Sets and Cracks, Pearl and Ivory Table Knives in Cases, and odds and ends.

The other window was made up largely of Plated and Copper Coffees and Teas, Fancy Thermometers, Five O'Clock Teas, Fine Skates, Fancy Cuspidors, Copper and Nickel Nursery Heaters and Alcohol Stoves, Carving Sets in every conceivable size, shape and casing, and a line of good Bathroom Fixtures on the side wall.

The window containing Chafing Dishes, &c., had a white background, and the other window a yellow background. Both windows were prepared by J. T. Rowand, who is connected with the firm.

Springfield Hardware Company's Window of Coffee and Tea Pots, Thermometers, Carving Sets, &c.

ADVERTISING IN A SMALL TOWN.

BY CLARFIELD.

Merchants in the Small Cities and Towns Can Often Do More Distinctive Advertising and Secure Greater Proportionate Returns Than Their City Cousins.

AT first thought a statement like that will seem somewhat incongruous, but let us look into the facts. In the smaller towns and villages less progress has been made along these lines than in the cities. It never fails that the man who does his work in a different way than his neighbor at once attracts attention to himself.

Still, radical extremes are as undesirable in these localities as they are elsewhere, because they are likely to attract a certain percentage of unfavorable notice as well as favorable attention. It is not the extremist who wins permanent success, but it is he who can quickly grasp a new idea and weigh its merits and apply it to his requirements. Therefore, the man who first adopts a good business idea in his locality naturally reaps the greatest benefit from it.

The Country Merchant Has a Certain Advantage

over the city man in the fact that there is less competition for new ideas in his field and less struggle than there is in the city to attain success and amass fortunes quickly. Life in a country town is so much more deliberate than in the large cities that a man who shows a reasonable amount of enterprise can get better results in proportion to his investments and his surroundings than can the city merchant.

This statement will be disputed, but nevertheless it

will stand investigation. In controversion of this statement many will point to the fact that men who have been only passable successes in small places have gone into the large cities and by dint of great courage and perseverance have succeeded almost beyond their own expectation. But it will be found that these men were made of the

Right Sort of Stuff

and it is also true that they rose to the occasion in their new surroundings and in many cases the new environment and the greater opportunities made their success. The fierce competition sharpened their wits and polished their business abilities, making of them clean-cut business diamonds, which were no less diamonds when they existed in the rough away back in the country. The small requirements of the village life and the lax competition of the country places would never have given the opportunity of cutting and polishing these diamonds out of the rough state.

Advertising in Its Strictest Sense

covers everything which a store does to attract attention, no matter what the nature of the effort may be. Therefore nearly every enterprising move of the country merchant may be generally classified under this heading. If he gives his store decorations more attention than his neighbor then he is doing at least one thing better than his competitors and is on the right road to successful business effort.

Newspaper Advertising.

The country merchant as a rule gives less attention to his newspaper advertising than to any other medium that he employs to attract public attention. In addition to the fact that he shows less energy in this direction he often permits his card to stand for a length of time without any change of copy. This is one of the first things which modern competition and enterprise overcomes in every business. Advertising space in the papers, the cost of which represents a considerable percentage of the year's net profits, should certainly be made to bring back every cent which can be gleaned from the investment.

There Is Only One Way

to do this, and that is by keeping good space clean and attractive. It is not necessary in most country papers to go into any extensive scheme of illustration or elaborate composition. A good, straightforward presentation of facts with a few simple attractive bold headlines will accomplish the right results.

A new subject should be dealt with every time a new issue of the paper comes out. Not all of the various announcements should be issued in the same style any more than several personal statements which are made to influence trade should be made in exactly the same manner to different natures.

Circulars and Other Mediums.

The same principles may be applied to all class of advertising which the local merchant may publish, but there are many conditions which will differ in various localities. The country merchant whose business promises development enough to make use of it may often find it profitable to issue an inexpensive folder or catalogue to mail to his farm and his suburban trade in order to counteract to some extent the efforts of the mail order houses.

Success Sometimes Limited.

The success of the country merchant is sometimes limited by the small trade within reach of his store. Thus he has an obstacle to meet which is entirely unknown to the merchant in the larger city or in a more swiftly growing locality. If the location is such that the business cannot be increased beyond a certain point on account of the small population or the slow growth in population in the vicinity, the merchant must be extremely careful not to expend more money on these lines than his business can afford.

A good way to avoid this danger is to have an expenditure for advertising purposes based upon a certain given percentage of the net income of the business. This will avoid all danger of spending more money than the business affords; in fact it is a plan which has been adopted by very many of the most notable business successes.

HARDWARE MERCHANTS' CATALOGUES, BOOKLETS, &c.

Henry Mohr Hardware Company, Tacoma, Wash., has issued a folder under the title of "Spring Hints." It is well printed on paper of good quality and effectively calls attention to Garden Tools, Fencing, Clothes Wringers, Food Choppers, &c.

Ed. Henderson, Lake Mills, Iowa, has issued a "Hardware Catalogue and Price-List," in which a few selections from his extensive line are illustrated. Comparison of his goods and prices is invited with other catalogues which may be in the possession of those to whom the publication was sent. The preparation of the matter contained in the catalogue was intrusted to Mr. Henderson's son, 18 years old, who is associated with him in the business, and whose first attempt at getting up a catalogue is very creditable.

H. Goldblatt Hardware Company, Kansas City, Mo., has issued a booklet entitled "Goldblatt's Handy Book for Plasterers." The object of the booklet, as set forth, is to intelligently present to the plasterer the difference in quality and price of each tool. It also calls attention to a number of new tools in this line.

In his May poster E. M. Austin, Litchfield, Ill., gives prominent place to the claim that since adding furniture and carpets to his former line of Hardware, Vehicles, Harness, Sporting Goods, Paints, &c., he has furnished complete "184 homes in 32 towns in 12 counties and two States." Mr. Austin distributes over 5000 of these posters monthly.

An attractively printed catalogue is that of the Manchester Hardware Company, Manchester, N. H., which next year will round out a half century of successful business growth at the same stand. This is the company's first catalogue, and with illustrations, prices and descriptive text gives a good idea of the extensive assortment of Hardware and Tools, Paints, Sporting Goods, Photographic Goods, House Furnishings, &c., carried. A special offer, good until July 1, entitles the purchaser of goods ordered from the catalogue to the amount of $5 or over to a valuable present.

Jarratt & Love, Nashville, Tenn., have issued their seventh annual spring catalogue, in which Screen Doors and Windows, Wire Cloth, Refrigerators, Water Coolers and other summer goods are effectively brought to the attention of their customers. The front cover of the catalogue is embellished with an exterior view of the store, an interior view being given on the back cover. This catalogue, besides being given out in the store, was mailed to a carefully selected list of desirable parties in all walks of life which it has taken several years to compile.

The Walter Hardware Company, South Milwaukee, Wis., in the May number of its *Hardware Store News*, calls attention to House Cleaning Utensils, Garden Implements, Vapor Stoves, Fencing, &c. There are a number of notes about new goods, in the introductory to which the policy of the company of keeping their lines up to date and free from stickers or shop worn goods is referred to. There is also a column of house cleaning hints and a chapter on the subject of Oil Stoves.

In connection with its "Ninth Annual Advertising and Bargain Days," April 5, 6 and 7, Wooster Hardware Company, Wooster, Ohio, issued an ingenious latch folder which was intended to convey the idea that the company's "latch string is out" during these special sales days. Presenting the folder at the store on the bargain days entitled the holder, if an adult, to a Buggy Whip free of charge whether or not a purchase was made. During these days samples of Agricultural Implements and Machinery were shown in operation, driven by a gasoline engine on the premises. As usual, the enterprise of the company was liberally rewarded in the way of spot sales, while a good foundation was laid for future business from the multitude of visitors on Hardware, Buggies, Harness, Implements, &c.

T. J. Giblin, Vail, Ia., has sold a half interest in his Hardware and Stove store to Richard McGuire, the business being continued under the style of Giblin & McGuire. The firm carries Shelf Hardware, Stoves, Tinware, Agricultural Implements, Paints, Oils, Sporting and Athletic Goods, Gasoline Engines, Incubators and Cream Separators.

Nelson D. Phelps of Phelps Bros., Hardware merchants, Barre, Mass., has purchased the interest in the firm of his brother, Henry A. Phelps. The business has been incorporated as the N. D. Phelps Company, with $25,000 capital stock and these officers: President and treasurer, N. D. Phelps; vice-president, Robert E. Inglis; secretary, H. A. Richardson.

INLAND EMPIRE IMPLEMENT AND HARDWARE DEALERS' ASSOCIATION.

HEREWITH we present portraits of the officers of the Inland Empire Implement and Hardware Dealers' Association and of the Washington Hardware and Implement Dealers' Mutual Fire Insurance Association, which has been successfully launched under the auspices of the

E. E. LUCAS.

R. L. SPIKER.

Inland Empire organization. E. W. Evenson of Spokane is the indefatigable secretary of both associations. The other officers are as follows: Inland Empire Association: President, E. E. Lucas, Davenport, Wash.; first vice-

A. URBAHN.

E. W. EVENSON.

president, R. L. Spiker, Nez Perces, Idaho; second vice-president, A. Urbahn, Spokane, Wash.; treasurer, J. A. Fridaker, Spokane, Wash. Washington Fire Insurance Association: President, W. P. Lucas, Davenport, Wash.;

J. A. FUDAKER.

W. P. LUCAS.

vice-president, C. A. Loy, Fairfield, Wash.; treasurer, Frank H. Shaw, Spokane, Wash.

The Inland Empire Association embraces merchants located in eastern Washington and western Idaho. A very creditable proportion of the Hardwaremen in this section of the country is represented on the membership roll as a result of energetic and persistent canvassing, and there will be no relaxing in the efforts to still further

C. A. LOY.

FRANK H. SHAW.

increase the numerical strength and influence of the association during the coming year.

AMERICAN SMALL TOOLS FOR GERMANY.

(FROM A SPECIAL CORRESPONDENT.)

I HAVE been asked by an American manufacturer if it would pay to send over small tools, such as screw drivers and awls and their handles. To this I would say most emphatically, "No." There are too many such things of low grade sold over here at prices with which no American maker could compete, at least in this market, and perhaps not in any other. I have just bought at retail prices a wood awl with (supposed) chisel point, 2½ inches long, exclusive of the tang, and one of 1 inch; the first with a varnished wooden handle 4¼ inches long, the second with a similar one of 3¼ inches; each handle having an iron ferrule, and all for the enormous sum of 12 pfennings, equal to a trifle less than 3 cents United States money. It is true that the stock of the tools proper is not first class (I shall use the larger one as a screw driver only), the handles have been turned between centers, so that at the butt there is a small center hole and a somewhat rough place, which do not increase one's comfort; but for all that, one can work with them after a fashion, and the dealers can sell them, and as yet keep no other kind in stock.

Hand Jig Saws.

There are probably more hand jig saws used in Germany than in any other country—certainly more per head of population. Every small boy is supposed to get one, some Christmas or other, as a reward of virtue or an incentive to industry or because it is the "correct thing," and his work therewith adorns the "present table" at Christmas and on birthdays. Yet Americans seem to have left this field to the Germans and Swiss. I think that both the bows and the blades could be furnished by us, particularly if provision were made for using the short blades resulting from breakages. If I were in this business I would furnish the blades in rolls like wire and let the dealers cut them off to suit the customers or sell them in the roll, for with amateurs—and especially young ones—breakages are common and costly. These rolls should preferably be on spools for convenience in handling, and each kind marked with the width and thickness in millimeters and the number of teeth per centimeter.

The interests of R. E. Briesenick and Colson Hardware Company, Brunswick, Ga., have been consolidated under the latter style. The large stock of Machinery and supplies formerly carried by Mr. Briesenick, who has become a member of the Colson Company, has been removed to the Colson establishment. The company has rented two additional stores as warehouses for its Hardware stock.

C. N. Ellithorpe & Sons have opened a Hardware store in Holden's Block, Palmer, Mass.

MISCELLANEOUS NOTES.

Independent Semisteel Registers.

Independent Register Company, Cleveland, Ohio, which has for some time been a manufacturer of cast iron registers, is now marketing what is known as the semisteel register, which is referred to as combining the advantages of both cast iron and steel goods. The face of this register is cast iron of attractive design, with large open area and, it is claimed, absolutely free from spring. The bottom is made of heavy steel, which being lighter than iron, is said to be easier to handle, less liable to breakage, and cheaper to ship by freight. Being shallower in depth, it also requires less storage room. The valves are declared to fit closer than in cast iron registers, entirely shutting off the heat when they are closed.

Hynson Tool & Supply Company.

Hynson Tool & Supply Company, 9-11 South Tenth street, St. Louis, Mo., has enlarged the base of its Champion barrel heater, so that it will take a larger size barrel than the ordinary package, being especially adapted to beer cooperage. The company has lately put on the market a combined punch and shear, catalogued as number 3.

Butterfield & Co.

Butterfield & Co., Derby Line, Vt., include in their 1906 catalogue and price-list a full line of solid hand reamers, locomotive reamers and shell reamers. The manufacture of these goods is a new departure for the firm.

Auto Fire Protector.

Empire Rubber Mfg. Company, Trenton, N. J., New York office, 88 Reade street, is manufacturing an auto tire protector made of the same extra quality of rubber and duck of which tires are made. It is laced over the tire through ten eyelets through heavy duck and rubber, and will run through mud and water without hardening or cracking. It is designed to lace over the outside casing of the tire when it has been cut, to prevent the inner tube bulging through the opening and bursting.

Ely's Dandy Broom Holder.

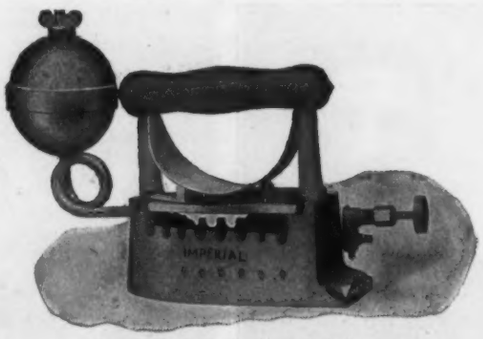
The accompanying illustration represents a broom holder, made of cast iron, finished in black japan. It is

Ely's Dandy Broom Holder.

alluded to as a sure catch—the heavier the load the tighter it locks. The device is simple in construction and is offered by Theo. J. Ely Mfg. Company, Girard, Pa.

Imperial Self Heating Sad Iron.

A self heating sad iron, referred to as convenient and economical, is herewith presented. It consists of a sad iron in connection with a gas generator and feeder and hydrocarbon reservoir. The main body and top plate of the flat iron is made of cast iron, polished and heavily nickel plated; the reservoir is made of heavy gauge spun brass, reinforced, buffed and nickel plated. At its interior the base is hollowed out to provide a combustion chamber, in which the gas generator and feeder is placed. A block fits in the cut away portion in the rear wall of the base, and the supply pipe, which leads from the lower end of the reservoir and communicates with the gas generator and feeder, fits in the cut away portion at the forward upper end of the base. A cover plate with an upright at its forward end and an upright at its rear end is pro-



Imperial Self Heating Sad Iron.

vided to retain the generator and feeder firmly in position within the combustion chamber of the base. A handle for the iron is attached to the upper ends of the uprights and a circular heat guard, attached at its ends to the uprights, is provided below the handle. By opening the needle valve in the closing plug of the hydrocarbon reservoir and the needle valve in the block a supply of hydro carbon liquid is permitted to flow into the cup-shaped depression of the base. This supply of hydrocarbon liquid, when ignited, serves to initially heat the block and vaporize the hydrocarbon passing through the passage therein. The hydrocarbon vapor jets through an aperture into the upper passage of the block and passage of the gas generator and feeder. Passing along the passage the vapor enters the hollowed out portion at the lower end of the gas generator and feeder and is ignited below the perforated plate. The flame emerging from the perforations of the plate serves to effectually heat the sad iron. In this sad iron the vapor is delivered in a downward direction to the center of the hollowed out portion at the bottom of the generator and feeder, and is evenly distributed throughout the combustion chamber of the iron, causing all parts to be uniformly heated. If desired compressed air may be supplied to the hydrocarbon reservoir through its closing plug from any suitable source of supply and will produce a steadier and stronger flame, and aid combustion generally. The self heating sad iron holds only one-sixth of a quart of oil. The iron is being manufactured and placed on the market by the Imperial Brass Mfg. Company, Chicago, Ill., who name among its good qualities ability to keep an even temperature, economy of time, because of saving the time required to heat a stove and the replacing of irons, and economy in money because of the infinitesimal cost of fuel.

Mirror Decoy Rat and Mouse Traps.

Piggott Mfg. Company, 9-13 Woodward avenue, Detroit, Mich., is putting on the market the mirror decoy traps for rats and mice, both being of the same style, but different in size. The feature of the trap, which is

Mirror Decoy Rat and Mouse Traps.

illustrated herewith, is the decoy mirror across the front of the trap and directly behind the bait trigger. The trap does not have to be covered with anything when set. It is also recommended for catching squirrels, weasels, gophers, &c.

Divine's Red Devil Water Motor.

The Divine Water Motor Company, Utica, N. Y., for which the Smith & Hemenway Company, 108-110 Duane street, New York, is direct representative, has recently put on the market an improved form of the Divine Red Devil water motor, for faucet connection, Fig. 1, and a larger one, having some distinctive features with a pulley

Fig. 1.—Divine's Red Devil Water Motor for Ordinary Use.

on for belt connection, Fig. 2. Both styles of motors can be coupled directly to a threaded sink faucet or bracketed, as in Fig. 1, wherever desired, getting the motive power by hose connection, this style requiring some provision for getting rid of waste water. A universal coupling can also be supplied that will permit of attaching these motors to plain faucets having no coupling thread. The water motor only, for ordinary family use, is listed at

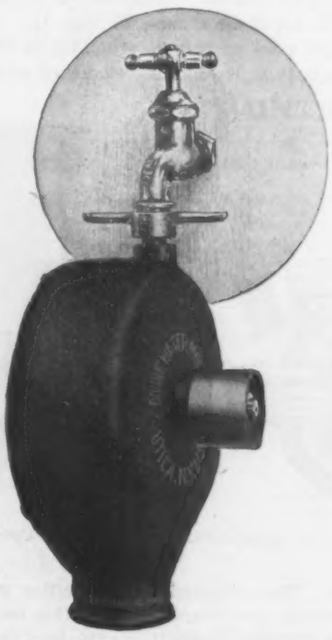
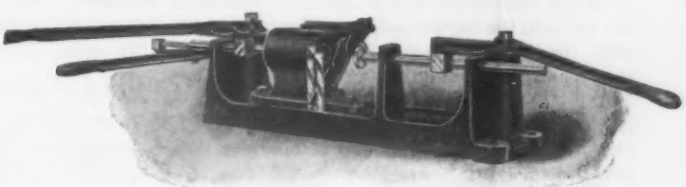


Fig. 2.—Same Style of Motor, Larger, with Belt Pulley.

$4.50, but with emery and buffing wheels, pulley and polish, listed at $5 each, is designed to furnish power for innumerable purposes in grinding, polishing, buffing, &c., that will readily suggest themselves. With 80 pounds water pressure there is said to be an ⅛ horse-power developed on the small motor and ¼ horse-power on the larger style, the bucket diameters of which are respectively 4 and 6 inches. The normal free speed on the motor with 4-inch buckets is given as 4500 revolutions per minute, both speed and power varying with the water pressure. The motor is powerful enough, we are advised, to carry buffing wheels up to 5 inches on the small size and up to 9 inches diameter on the larger one. In operation the water strikes directly eight double cast brass nickeled caps or buckets, which are trued up. The buffing and emery wheels, &c., are held by two metal flanges 1½ inches in diameter, which by a wing nut, to be tightened by thumb and fingers only, hold the wheels securely. The outer dimensions of the shell or casing of the smaller motor are 2¼ x 5¾ inches, with 1¾-inch outlet and 5-16-inch shaft. The shell of the larger motor is 3½ x 7½ inches. Another new and important feature is a jointed, two piece rest, Fig. 1, which is secured on the arbor casing at any desired angle, so that a tool or other article can be held true in sharpening, polishing, &c. With the smaller motor are included a blue wool buff, ½ x 3¾ inches, box of polishing paste for silver, brass and nickeled work, beveled emery wheel 4 inches in diameter with ⅝-inch bevel and a grooved wood pulley 11-16 x 1¾ inches for carrying a round belt. The larger and latest motor is similar in construction, but has a pulley on as furnished for either a flat belt, as shown in the engraving, or with grooved pulley for a round belt. This motor has ball bearings and is offered by the makers as capable of driving small machines, such as washing and sewing machines, wringers, ice cream freezers, horse clippers, cream separators, small printing presses, churns, coffee mills, meat choppers and kindred commodities. Provision is also made for having the motor shaft at different angles by using a swiveled coupling, which the company furnishes.

Rapid Repair Mill for Cartridges.

W. P. Markle & Co., St. Louis, Mo., are offering the mill for cartridges shown herewith. It resizes, decaps, recaps and irons exploded shells, so that they can be handled in the loader almost as easily as new shells. The mill is described as being strong and durable, weighing 40 pounds. The point is made that dealers who handle loaded shells complain that there is little profit



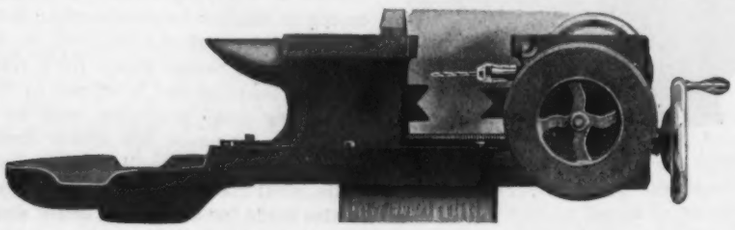
Rapid Repair Mill for Cartridges.

in them, and that no merchant attempts to carry all of the almost endless variety in stock; also that new loads as to kind or quantity of powder, shot or wadding, are constantly coming into favor, which the merchant cannot supply from his stock. It is suggested that a merchant having one of these mills can arrange with the local gun club to take back all of its empty shells, and can repair and reload them in a perfectly satisfactory manner at a cost far less than factory loaded shells. Thus the merchant can do away with the item of unsalable stock and can supply any load customers call for. It is pointed out that the labor of repairing and reloading can be done to good advantage by a clerk or porter in otherwise idle hours.

The Heyde-Cox-Townsend Company, Marion, Ill., has incorporated with a capital stock of $18,000, to conduct a wholesale and retail business in Stoves, Hardware, Harness, Farming Implements, Paints and Oils. The incorporators are George C. Heyde, A. M. Townsend and T. A. Cox.

Detroit Combination Tool.

Detroit Tool Company, Detroit, Mich., is the manufacturer of the Detroit combination tool here shown. The device has been evolved in an effort to combine in one tool or machine all the necessary equipment of a repair shop, comprising a drill, vice, pipe vise, emery wheel, anvil, forge and blower. In detail the tool consists of a steel faced bed or base, having at one end a stationary head stock, at the other a movable tail stock and an overhung forge pan. The head stock contains the mechanism of the rotary blower, drill, grinder and the stationary part of the vise and pipe vise jaw. The tail stock serves as an anvil, a support for work being drilled and the movable member of the ordinary and pipe clamping vises. This part slides on the bed between two adjustable guides and is operated through a screw by the hand wheel at the outer end of the head stock. The air delivered by the blower in the head stock is conveyed through a channel in the base to the forge at the opposite end. The fan shaft of the blower projects through the air intake at the front side of the gear case and is fitted to receive an emery wheel, the intake being so located as to form a current of air drawing the emery dust into the forge and away from the operator. The blower and emery wheel are operated by a crank wheel located on the rear side of the gear case. The crank wheel is fitted with a pulley for the application of power when so desired. The fan and emery wheel are geared 12 to 1 and may be run by hand, 2000 revolutions per minute. The drill is operated by the same driving wheel, being fitted with a clutch arrangement, so that it may be thrown in and out of gear at the will of the operator, and either drill or blower may be operated independently of each other. The emery wheel is of special construction, having an open center, with the spokes beveled propeller fan fashion to throw the air into the blower intake. The accessories furnished with the tool include drills, a blacksmith's hardy and tongs and a crucible holder for holding a crucible or metal ladle over the fire. This also may be used for holding a soldering iron when it is desired to heat it over the forge fire. The tool is made in two models, A and B, listing at $25 and $50, respectively.



Detroit Combination Tool Model B.

Gaines Automatic Lock Nut.

The Capitol Lock Nut & Washer Company, Columbus, Ohio, is offering the automatic lock nut shown in the accompanying cuts. In Fig. 1 the device is illustrated as applied to rail joints and shows the tongue, which is a part of the square washer, protruding into the ratchet face nut. The washer and nut used for rails are illustrated in Fig. 2, which shows how the tongue is made. The tongue is only one-half the thickness of the washer, thereby forming a protecting recess, as only the end going into the ratchet comes in contact with the nut. The ratchets which are pressed in the face of the nut are referred to as not impairing its bearing surface. The company also furnishes a bolt holder, for use with the lock nut and washer, when applied to arch bars on car trucks. It is explained that the bolt holder obviates the necessity of using double nuts, extra length of bolt, extra thread, cost of drilling holes for cotter pins, cost of pins, and saves the labor of one man to hold the bolt.

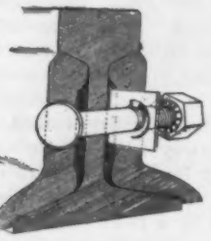
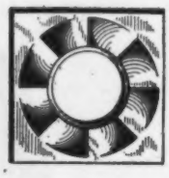


Fig. 1.—Gaines Automatic Lock Nut.

Washer.

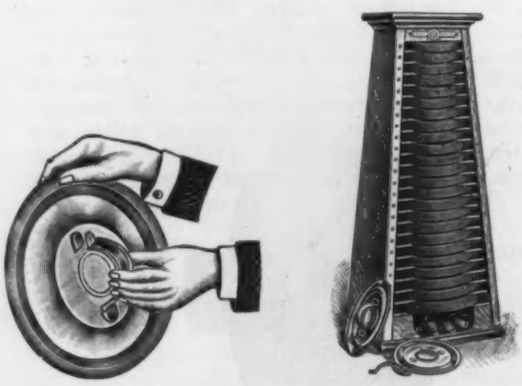


Nut.

Fig. 2.—Washer and Nut of Gaines Lock Nut.

Lasher's Spring-In Handle Pot Cover and Cabinet.

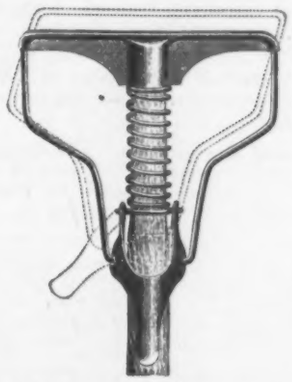
C. W. Lasher Mfg. Company, Davenport, Iowa, is offering the pot covers, with spring-in handle, and stock cabinet for holding them, as illustrated in the accompanying cuts. The cabinet is referred to as being finely finished. Each shelf is numbered and the 24 shelves accommodate 24 sizes of covers, from 7½ to 13½ inches. The bin at the bottom is for handles, all of which fit any size of cover. The nickeled steel handles are sprung into the recesses in the covers, the operation requiring but a moment and are held there, it is explained, as firmly as if riveted. No hammer is required to clinch the handles, and as each size of cover is kept separate there is no need of rummaging in a pile of miscellaneous covers to find the size desired. The company is furnishing the cabinet with a full assortment of covers and handles and shows that there is a good profit on the investment, with the cabinet free, when the first stock has been sold.



Lasher's Spring-in Handle Pot Cover and Cabinet.

Ely's Dandy Mop Head No. 13.

Theo. J. Ely Mfg. Company, Girard, Pa., is offering the mop head here shown. The coil spring is made of the best coppered steel spring wire and is alluded to as having

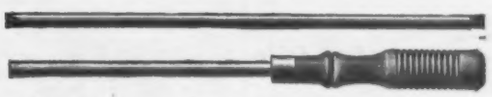


Ely's Dandy Mop Head No. 13.

an unusually large number of coils, which adds to the life of the spring. The lever is made of steel, and has a double bearing connection with the spring, which obviates the necessity of a ring in connection with the lever. Metal parts are coppered finish and the heads are provided with red or white handles.

Criss Cross Gun Rod.

The Reversible Tube Cleaner Company, Worcester, Mass., is putting on the market the gun rod shown here-

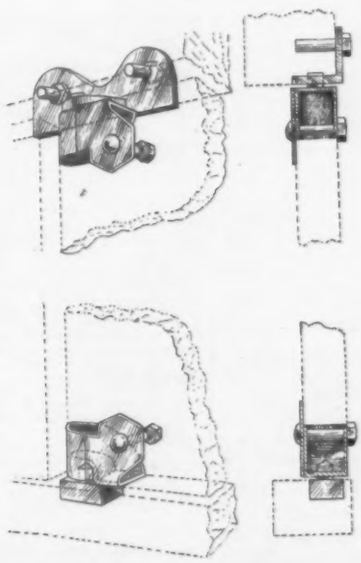


Criss Cross Gun Rod.

with. It is made in three sections, which screw tightly together when it is desired to use it, and which, when taken apart, permit the rod to be carried in a case 11 inches in length. It is manufactured of polished brass tubing, three-eighths inch in diamater, with rubberoid handle which forms a pleasing contrast to the brass and at the same time is impervious to moisture. The rod takes any gun cleaner.

Pivot Hinges and Attachments for Stone Doors No. 2190.

The pivot hinges, front and side views of which are shown herewith, are designed for stone doors of mausoleums, &c. The advantage of this style of hinge is that the doors are set in sockets and pivoted to the floor below and to the lintel above. It is pointed out that heavy doors can be pushed in and out with minimum friction if



Pivot Hinges and Attachments for Stone Doors No. 2190.

secured above and below in the manner described, making the attachments of the door to the building, as well as the door, practically perpetual, with the aid of bronze metal. The hinges and attachments are offered by J. J. Ryan & Co., corner Monroe and Jefferson streets, Chicago, Ill.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	₱ gal.	
Linseed, City, raw	.40	@41
Linseed, City, Boiled	.41	@42
Linseed, State and West'n, raw	.38	@39
Linseed, raw Calcutta seed		@68
Lard, Extra Prime, Winter	.71	@72
Lard, Extra No. 1	.52	@53
Lard, No. 1	.42	@44
Cotton-seed, Crude, f.o.b. mills	.31	@31½
Cotton-seed, Summer Yellow, Prime	.38½	@39
Cotton-seed, Summer Yellow, off grades	.36	@37½
Sperm, Crude	.65	@..
Sperm, Natural Spring		@..
Sperm, Bleached Spring		@..
Sperm, Natural Winter	.63	@65
Sperm, Bleached Winter	.66	@67
Tallow, Prime	.51	@53
Whale, Crude	.32	@33
Whale, Natural Winter	.42	@44
Whale, Bleached Winter	.44	@46
Extra Bleached Winter	.46	@50
Menhaden, Brown, Strained	.26	@29
Menhaden, Light, Strained	.27	@30
Menhaden, Bleached, Winter		@..
Menhaden, Ex-Bld., Winter		@..
Menhaden, Southern		@..
Cocoanut, Ceylon	₱ lb 6½	@ 7
Cocoanut, Cochin	₱ lb 8	@ 8¼
Cod, Domestic, Prime	.30	@31
Cod, Newfoundland	.35	@37
Red, Elaine	.37	@40
Red, Saponified	₱ lb 4½	@ 5
Olive, Italian, bbls	.57	@60
Neatsfoot, prime	.48	@49
Palm, Logos	₱ lb 6	@ 6¼

Mineral Oils—

Black, 29 gravity, 25@30 cold test	₱ gal.	10½@11½
Black, 29 gravity, 15 cold test		11½@12½
Black, Summer		10½@11½
Cylinder, light filtered	.18	@19
Cylinder, dark filtered	.16	@17
Paraffine, 903-907 gravity		13½@14
Paraffine, 903 gravity		12½@13
Paraffine, 883 gravity		10¼@10¾
Paraffine, Red		12½@14

In small lots ½¢ advance.

Miscellaneous—

Barytes:		
White, Foreign	₱ ton	$17.50@19.00
Amer. floated	₱ ton	19.00@.....
Off color, No. 2	₱ ton	13.50@15.00
Chalk, in bulk	₱ ton	3.00@ 3.25
Chalk, in bbls	₱ 100 lb	....@ .35
China Clay, English	₱ ton	12.00@17.00
Cobalt, Oxide	₱ 100 lb	2.50@ 2.60
Whiting, Common	₱ 100 lb	.43@ .48
Whiting, Gilders	₱ 100 lb	.50@ .55
Whiting, Ex. Gilders	₱ 100 lb	.55@ .60

Putty, Commercial—₱ 100 lb

In bladders	$1.70	@1.85
In bbls. or tubs	1.20	@1.40
In 1 lb to 5 lb cans	2.65	@2.95
In 12½ to 50 lb cans	1.50	@1.90

Spirits Turpentine—₱ gal.

In Oil bbls	.62	@62½
In machine bbls	.62½	@63

Glue—

	₱ lb	
Cabinet	.11	@15
Common Bone	.7	@ 9
Extra White	.18	@24
Foot Stock, White	.11	@14
Foot Stock, Brown	.8	@11
German Hide	.12	@18
French	.10	@40
Irish	.13	@16
Low Grade	.9	@12
Medium White	.14	@17

Gum Shellac—

	₱ lb	
Bleached Commercial		@40
Bone Dried		@50
Button	.40	@60
Diamond I.	.53	@55
Fine Orange	.48	@50
A. C. Garnet	.41	@42½
D. C	.56	@60
Octagon B		@62
T. N	.43	@44
V. S. O	.53	@55

Colors in Oil—

	₱ lb	
Black, Lampblack	.12	@14
Blue, Chinese	.36	@46
Blue, Prussian	.32	@36
Blue, Ultramarine	.13	@16
Brown, Vandyke	.11	@14
Green, Chrome	.12	@16
Green, Paris		@24
Sienna, Raw	.12	@15
Sienna, Burnt	.12	@15
Umber, Raw	.11	@14
Umber, Burnt	.11	@14

White Lead, Zinc, &c.—

	₱ lb	
Lead, English white, in Oil	9¼@	9¾
Lead, American white, in Oil:		
Lots of 500 lb or over	.. @	7¼
Lots less than 500 lb	.. @	7¾
In Barrels	.. @	6¾
Lead, White, in oil, 25 lb tin pails, add to keg price	.. @	⅛
Lead, White, in oil, 12½ lb tin pails, add to keg price	.. @	1
Lead, White, in oil, 1 to 5 lb ass'ted tins, add to keg price	.. @	1½

Lead, American, Terms: For lots 12 tons and over ¼¢ rebate; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice, for lots of less than 500 lbs. net.

	₱ lb	
Lead, White, Dry, in bbls	.. @	6¾
Zinc, American, dry	4½@	5
Zinc, French:		
Antwerp, Red Seal, dry		8¾
Antwerp, Green Seal, dry		9¼
Paris, Red Seal, dry		9¼
Paris, Green Seal, dry		10½

Zinc, V. M. French, in Poppy Oil:

Green Seal:		
Lots of 1 ton and over	12¾@	13¼
Lots of less than 1 ton	12¾@	13¾

Zinc, V. M. French, in Poppy Oil:

Red Seal:		
Lots of 1 ton and over	11¾@	11¾
Lots of less than 1 ton	11¾@	12¼

Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or mixed grades, 1%: 25 bbls., 2%; 50 bbls., 4%.

Dry Colors—

	₱ lb	
Black, Carbon	.5	@10
Black Drop, American	.4	@ 6
Black Drop, English	.5	@15
Black, Ivory	.16	@20
Lamp, Com	4½@	6
Blue, Celestial	.4	@ 6
Blue, Chinese	.29	@32
Blue, Prussian	.27	@30
Blue, Ultramarine	4½@	15
Brown, Spanish	½@	1
Carmine, No. 40	$3.30@	3.40
Green, Chrome, ordinary	3½@	6
Green, Chrome, pure	.17	@25

Lead, Red, bbls., ½ bbls. and kegs:

Lots 500 lb or over	.. @	7¼
Lots less than 500 lb	.. @	7¾
Litharge, American, bbls	.. @	7¼
Ocher, American	₱ ton	$8.50@16.00
Ocher, American Golden	2½@	3½
Ocher, French	1¼@	2½
Ocher, Foreign Golden	3	@ 4
Orange Mineral, English	.10	@12
Orange Mineral, French	.10¾	@12
Orange, Mineral, German	8½	@10
Orange, Mineral, American	8½	@ 8¾
Red, Indian, English	4½	@ 8½
Red, Indian, American	3	@ 3¾
Red, Turkey, English	4	@10
Red, Tuscan, English	7	@10
Red, Venetian, Amer.	₱ 100 lb	$0.50@1.25
Red Venetian, English	100 lb	$1.15@1.75

Sienna, Italian, Burnt and Powdered 3 @ 9¼

Sienna, Ital., Raw, Powd	3	@ 6½
Sienna, American, Raw	1¼@	2

Sienna, American, Burnt and Powdered 1¼@ 2

Talc, French	₱ ton	$15.00@30.00
Talc, American	₱ ton	15.00@25.00
Terra Alba, French	₱ 100 lb	90 @1.00
Terra Alba, English	₱ 100 lb	90 @1.00

Terra Alba, American, ₱ 100 lb, No. 1 .70 @80

Terra Alba, American, ₱ 100 lb, No. 2 .60 @65

Umber, Turkey, Bnt. & Pow	2¼@	3½
Umber, Turkey, Raw & Pow	2¼@	3½
Umber, Burnt, Amer	1¼@	2
Umber, Raw, Amer	1¼@	2
Yellow Chrome	.12	@14
Vermilion, American Lead	.10	@25
Vermilion, Quicksilver, bulk		@65
Vermilion, Quicksilver, bags		@66
Vermilion, English, Import	.75	@80
Vermilion, Chinese	$0.90@	1.00

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1905, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Domestic, ₰ doz. $3.00.....33⅓%
North's 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition— See *Caps, Cartridges, Shells, &c.*

Anvils—American—

Eagle Anvils.....₰ lb 6¾@7 ¢
Hay-Budden, Wrought.....9@9¼ ¢
Horseshoe brand, Wrought.....9@9¼ ¢
Trenton .....₰ lb 9@9¼ ¢

Imported—

Peter Wright & Sons.....₰ lb 10¼ ¢

Anvil, Vise and Drill—

Millers Falls Co., $18.00.....15&10%

Apple Parers— See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Livingston Nail Co.....33⅓%

Augers and Bits—

Com. Double Spur.....75@75&5%
Jennings' Patn., reg. finish.....50&10@60%
Black Lip or Blued.....60&10%
Boring Mach. Augers.....70&10%
Car Bits, 12-in. twist.....50&10%
Ford's Auger and Car Bits.....40&5
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list..25%
No. 30, R. Jennings' list.....40&7½%
Russell Jennings'.....25&10&2½%
L'Hommedieu Car Bits.....15%
Mayhew's Countersink Bits.....45%
Millers Falls.....50&10&7½%
Ohio Tool Co.'s Bailey Auger and Car Bits.....40&10%
Pugh's Black.....30%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....60%
Snell's Car Bits, 12-in. twist....60&10%
Wright's Jennings' Bits.....50%

Bit Stock Drills—

See *Drills, Twist.*

Expansive Bits—

Clark's small, $18; large, $26....50&10%
Clark's Pattern, No. 1, ₰ doz. $26; No. 2, $18.....65%
Ford's, Clark's Pattern.....60&5%
C. E. Jennings & Co., Steer's Pat..25%
Swan's 60%

Gimlet Bits—

Per gro.
Common Dble. Cut....$3.00@3.25
German Pattern, Nos. 1 to 10, $1.60; 11 to 13, $5.75

Hollow Augers—

Bonney Pat., per doz..$5.50@6.00
Ames .....25&10%
Universal 20%
Wood's Universal.....25%

Ship Augers and Bits—

Ship Augers.....45&5@—%
Ford's .....33⅓&5%
C. E. Jennings & Co.:
L'Hommedieu's 15%
Watrous' .....35&5%
Ohio Tool Co.'s.....40%
Snell's 40%

Awl Hafts— See *Handles, Mechanics' Tool.*

Awls—

Brad Awls:
Handled .....gro. $2.75@3.00
Unhdld, Shldered..gro.65@66¢
Unhandled, Patent..gro.66@70¢
Peg Awls:
Unhandled, Patent..gro. $1@$1¢
Unhdld, Shldered..gro. 65@70¢
Scratch Awls:
Handled, Com...gro. $3.50@4.00
Handled, Socket..gro.$11.50@12.00
Hurwood 40%

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights:
First Quality.....$4.75@5.00
Second Quality.....$4.25@4.50
Double Bit, base weights:
First Quality.....$7.00@7.50
Second Quality.....$6.50@6.75

Axle Grease—

See *Grease, Axle*

Axles— Iron or Steel

Concord, Loose Collar...4¼@4¾¢
Concord, Solid Collar...4¾@5¼¢
No. 1 Common, Loose...3¼@3¾¢
No. 1½ Com., New Style3¾@4¼¢
No. 2 Solid Collar.....4¼@4¾¢
Half Patent:
Nos. 7, 8, 11 and 12....75@75&5%
Nos. 13 to 14.....70&10@75&5%
Nos. 15 to 18...75&10@75&10&5%
Nos. 19 to 22...75&10@75&10&5%

Boxes, Axle—

Common and Concord, not turned lb..4½@5¢
Common and Concord, turned. lb., 5½@6¢
Half Patent.....lb. 8½@9¢

Bait— Fishing—

Hendryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20&5%

Balances— Sash—

Caldwell new list.....50%
Pullman .....50&10@60%

Spring—

Spring Balances.....50&10@60%
Chatillon's:
Light Spg. Balances.....50&10%
Straight Balances.....40@50%
Circular Balances.....50&10%
Large Dial.....30%

Barb Wire—See *Wire, Barb.*

Bars— Crow—

Steel Crowbars, 10 to 40 lb.... per lb., 3¼¢

Towel -

No. 10 Ideal, Nickel Plate..₰ gro. $8.50

Beams, Scale—

Scale Beams.....40&10@50%
Chattillon's No. 1.....30%
Chattillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered ₰ doz. $0.85; Tinned $1.00
No. 11 Wire Coppered ₰ doz. $1.10; Tinned $1.20
No. 10 Wire Galvanized..₰ doz. $1.75
Western W. G. Co.:
No. 1 Electric.....₰ gro. $7.80
No. 2 Buffalo.....₰ gro. $9.00
No. 3 Perfection Dust.....₰ gro. $8.00

Egg—

Holt-Lyon Co.:
Holt, No. A, Japanned....₰ doz. $1.20
Holt, No. 1, Tinned.....₰ doz. $1.50
Holt, No. B, Japanned....₰ doz. $2.00
Holt, No. 2, Tinned.....₰ doz. $2.25
Lyon, No. 2, Japanned....₰ doz. $1.25
Lyon, No. 3, Japanned....₰ doz. $1.50
Taplin Mfg. Co.: ₰ gro.
No. 60 Improved Dover.....$6.00
No. 75 Improved Dover.....$6.50
No. 100 Improved Dover.....$7.00
No. 102 Improved Dover, Tin'd..$8.50
No. 150 Improved Dover, Hotel..$15.00
No. 152 Imp'd Dover, Hotel, T'd.$17.00
No. 200 Imp'd Dover Tumbler....$8.50
No. 202 Imp'd Dover Tumbler, T'd.$9.50
No. 300 Imp'd Dover Mammoth, ₰ doz. $25.00
Turner & Seymour Mfg. Co.:
T. & S. Dover.....$6.00
Western, W. G. Co., Buffalo.....$7.00
Wonder (R. M. Co.)..₰ gro. net, $6.00

Bellows—

Blacksmith, Standard List.. 60&10@70&10%

Hand—

Inch..	*6*	*7*	*8*	*9*	*10*	*Net Prices.*
Doz...	*$4.75*	*5.70*	*6.65*	*7.60*	*8.55*	

Molders—

Inch..	*9*	*10*	*11*	*12*	*14*	*Net Prices.*
Doz...	*$8.00*	*9.00*	*10.50*	*12.50*	*14.50*	

Bells— Cow—

Ordinary goods...75&5@75&10&5%
High grade.....70&10@70&10&5%
Jersey .....75&10%
Texas Star.....50%

Door—

Abbe's Gong.....45%
Burton Gong.....50%
Home, R. & E. Mfg. Co.'s.....55&10%
Lever and Pull, Sargent's....60&10&10%
Trip Gong.....50&10@50&10&5%
Yankee Gong.....55%

Hand—

Hand Bells, Polished, Brass.60&10%
White Metal.....60%
Nickel Plated.....50&10&60%
Swiss .....60@60&7½%
Cone's Globe Hand Bells.....33⅓&35%
Silver Chime.....35⅓@35%

Miscellaneous—

Farm Bells.....lb. 2¼¢
Steel Alloy Church and School 50&10@60%
American Tube & Stamping Co. Gongs 70%
Table Call Bells.....50@50&10%

Belting— Leather—

Extra Heavy, Short Lap..60&5%
Regular Short Lap....60&10&5%
Standard 70%
Light Standard.....70&5%
Cut Leather Lacing.....50%
Leather Lacing Sides, per sq. ft. 25¢

Rubber—

Agricultural (Low Grade).... 75@75&5%
Common Standard....70@70&10%
Standard .....60&5@60&10%
Extra .....60@60&5%
High Grade.....50&5@50&10%

Bench Stops—

See *Stops, Bench*

Benders and Upsetters, Tire—

Detroit Perfected Tire Bender.....40%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, $4.25; No. 2, $7.25; No. 3, $10.50; No. 4, $16.25; No. 5, $29.50.
Green River Tire Benders and Upsetters 20%

Bicycle Goods—

John S. Leng's Son's 1902 list:
Chain 50%
Parts 60%
Spokes 50%
Tubes 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks— Tackle—

Common Wooden.....70&10@75%
Hartz St. Tackle Blocks.....50@50&5%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Junior 30%
Stowell's Novelty, Mal. Iron....50&10%
Stowell's Self Loading.....60%
See also Machines, Hoisting.

Boards, Stove—

Zinc, Crystal, &c.....40%
Paper Embossed.....40&10%

Boards, Wash—

See *Washboards.*

Bobs, Plumb—

Keuffel & Esser Co.....33⅓%

Bolts—

Carriage, Machine, &c.—

Common Carriage (cut thread): ⅝ x 6 and smaller.....75@—%
Larger and Longer..65&5@—%
Phila. Eagle, $3.00 list May 2½, '99 80%
Bolt Ends, list Feb. 14, '95.... 65&10@—%
Machine, ⅝ x 4 and smaller 75@—%
Machine, larger and longer.. 65&5@—%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knob:

Inch.....	*3*	*4*	*5*	*6*	*8*
Per doz..	*$0.30*	*.35*	*.45*	*.60*	*.80*

Cast Iron Spring Foot, Jap'd:

Inch.....	*6*	*8*	*10*
Per doz.....	*$1.20*	*1.50*	*2.25*

Cast Iron Chain, Flat, Japanned:

Inch.....	*6*	*8*	*10*
Per doz.....	*$1.00*	*1.40*	*1.65*

Cast Iron Flat Shutter, Jap'd., Brass Knobs:

Inch.....	*6*	*8*	*10*
Per doz.....	*$0.75*	*.95*	*1.25*

Wrt Barrel Japd.....80@80&10%
Wrt " Bronzed....50@50&10%
Wrt. Spring...70&10@70&10&10%
Wrt. Shutter.....50&5@50&10&5%
Wrt. Square Neck....75@75&10%
Wrt Square.66⅔&10@66⅔&10&10%
Ives' Patent Door.....40%

Plow and Stove—

Plow .....65&10@—%
Stove .....87½&10@—%

Tire—

Norway Iron.....80%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Bay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Eclipse, list Dec. 28, '99.....80%
Mount Carmel Bolt Co.:
Norway Phila., list Oct. 16, '84....80%
Eagle Phila., list Oct. 16, '84....82½%
Mount Carmel, list Dec. 28, '99...80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct., '84.....80%
Upson Nut Co.:
Tire Bolts.....72½%

Borers, Tap—

Borers Tap, Ring, with Handle:

Inch.....	*1¼*	*1½*	*1¾*	*2*
Per doz...	*$4.80*	*5.60*	*6.40*	*8.00*
Inch			*2¼*	*2½*
Per doz.....			*$6.65*	*11.50*

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.65@$1.75; No. 3, $2.50 each....25%

Boxes, Mitre—

C. E. Jennings & Co.....30%
Langdon .....15&10%
Perfection 40%
Seavey 33⅓%
Stanley R. & L. Co.:
Nos. 240 to 460.....30%
Nos. 50 and 60.....35%

Braces—

Common Ball, American..$1.25@1.30
Barber's .....50&10&10@60&10%
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 120, 81 to 123, 207 to 411 .....60%
C. E. Jennings & Co.....50&5%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat...50%
Millers Falls Drill Braces.....25&10%
P., S. & W. Co., Peck's Pat.60@60&5%
Stanley R. & L. Co.:
Stanley 35%
Victor 45%

Brackets—

Wrought Steel...80&10@80&10&5%
Griffin's Pressed Steel.....80@80&10%
Griffin's Folding Brackets.....70&10%
Stowell's Cast Shelf.....75%
Stowell's Sink.....50%
Western, W. G. Co., Wire.....60&10%

Bright Wire Goods—

See *Wire and Wire Goods.*

Broilers—

Kilbourne Mfg. Co.....75&20%
Western, W. G. Co.....80%
Wire Goods Co.....75@75&10%

Buckets, Galvanized—

Price per dozen.

	Quart.....	*10*	*12*	*14*
Water, Regular...		*1.40*	*1.70*	*1 90*
Water, Heavy....		*3.40*	*3.70*	*3.80*
Fire, Rd. Bottom..		*2.30*	*2.55*	*2.95*
Well		*2.55*	*2.87*	*3.15*

Bucks, Saw—

Hoosier.....₰ gro. $36.00

Bull Rings—See *Rings, Bull*

Butts— Brass—

Wrought, list, Sept., '96..15@—%
Cast Brass, Tiebout's.....50%

Cast Iron—

Fast Joint, Broad....40&10@50%
Fast Joint, Narrow....40&10@50%
Loose Joint.....70&10@75%
Loose Pin.....70&10@75%
Mayer's Hinges.....70@70&5
Parliament Butts.....70@70&5

Wrought Steel—

	Discount.	
Reversible and Broad..	*75&5%*	*Extra, 10&10@*
Light Reversible, Light Narrow	*75&10%*	
Loose Joint, Narrow, L'ht Inside Blind, etc.....	*75%*	
Back Flaps, Table, Chest.	*70&10%*	

Cages, Bird—

Hendryx Brass:
3000, 5000, 1100 series.....5%
1200 series.....33⅓%
200, 500, 600 and 900 series.....60&10%
Hendryx Bronze:
700, 800 series.....40&10%
Hendryx Enameled.....40&10%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong.....per lb. 4¼@4¾¢
Sharp, 1 prong...per lb., 4¼@4¾¢
Burke's Blunt.....4¾@5¼¢
Burke's Sharp.....4¾@5¼¢

Gautier, Blunt....4@4¼¢
Gautier, Sharp....4½@4¾¢
Perkins', Blunt Toe....₱ lb 3.65¢
Perkins', Sharp Toe....₱ lb 4.15¢

Can Openers—
See *Openers, Can.*

Cans, Milk—

	5	8	10 gal.	
Illinois Pattern	$1.35	1.85	2.05	each.
New York Pattern	1.50	2.20	2.45	each.
Baltimore Pattern	1.50	2.20	2.45	each.
Dubuque	1.35	1.60	1.75	each.

Cans, Oil—
Buffalo Family Oil Cans:

3	5	10 gal.
$18.00	60.00	129.60 gro., net.

Caps, Percussion—
Eley's E. B....52@55¢
G. D....per M 34@35¢
F. L....per M 40@42¢
G. E....per M 48@50¢
Musket....per M 62@63¢

Primers—
Berdan Primers, $2 per M...20%
B. L. Caps (Sturtevant Shells) $2 per M....20%
All other primers per M.$1.52@1.60

Cartridges—
Blank Cartridges:
32 C. F., $5.50....10&5%
38 C. F., $7.00....10&5%
22 cal. Rim, $1.50....10&5%
32 cal. Rim, $2.75....10&5%
B. B. Caps, Con. Ball, Swga..$1.90
B. B. Caps, Round Ball....$1.49
Central Fire....25%
Target and Sporting Rifle..15&5%
Primed Shells and Bullets.15&10%
Rim Fire, Sporting....50%
Rim Fire, Military....15&5%

Casters—
Bed....70@70&10%
Plate....60&10@60&10&5%
Philadelphia....75@75&10%
Acme, Ball Bearing....33⅓%
Boss....70&10%
Boss Anti-Friction....70&10%
Gem (Roller Bearing)....80%
Martin's Patent (Phoenix)....45%
Standard Ball Bearing....45%
Tucker's Patent low list....30%
Yale (Double Wheel) low list....50%

Cattle Leaders—
See *Leaders, Cattle.*

Chain, Coil—
American Coil, Straight Link:

3-16	¼	5-16	⅜	7-16	½	9-16
$8.70	5.90	4.95	4.20	4.05	3.95	3.90
⅝	¾	⅞ to 1		1⅛ to 1¼ inch.		
$3.85	3.70	3.65		3.80		

German Coil....60&10&10@70%

Halter—
Halter Chains....60&5@60&10%
German Pattern Halter Chains, list July 24, '97....60&10&10%
Covert Mfg. Co.
Halter....35&5%
Covert's Saddlery Works
Halter....70%

Cow Ties—
See *Halters and Ties.*

Trace, Wagon, &c.—
Traces, Western Standard: 100 pr.
6½—6-3, Str'ght, with ring..$25.00
6½—6-2, Str'ght, with ring..$26.00
6½—8-2, Str'ght, with ring..$30.00
6½—10-2, Str'ght, with ring..$35.00
NOTE.—Add 2c per pair for Hooks. Twist Traces 2c per pair higher than Straight Link.
Eastern Standard Traces, Wagon Chain, &c....60&10%

Miscellaneous—
Jack Chain, list July 10, '93:
Iron....60&10%
Brass....60&10%
Safety Chain....70&10%
Gal. Pump Chain....lb. 4@4½¢
Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stallion....40%
Covert Sad. Works:
Breast, Hold Back, Rein....70%
Oneida Community:
Am. Dog Leads and Kennel Chains....40@40&5%
Niagara Dog Leads and Kennel Chains....45@60&5%
Wire Goods Co.:
Dog Chain....70&10%
Universal Dbl.-Jointed Chain....50%

Chain and Ribbon, Sash—
Oneida Community:
Copper Chain....60&5%
Steel Chain....60%
Pullman:
Bronze Chain....60%
Steel Chain....60&10%
Sash Chain Attachments, per set..8¢
Aluminoy Sash Ribbon, per 100 ft....$1.25@$3.00
Sash Ribbon Attachments, per set.8¢

Chalk—(From Jobbers.)
Carpenters' Blue....gro. 38@40¢
Carpenters' Red....gro. 33@35¢
Carpenters' White....gro. 28@30¢
See also Crayons.

Checks, Door—
Bardsley's....45%
Eclipse....60&10%
Pullman, per gro....$54.00
Russwin....40%

Chests, Tool—
American Tool Chest Co.:
Boy's Chests, with Tools....55%
Youths' Chests, with Tools....40%
Gentlemen's Chests, with Tools..30%
Farmers', Carpenters', etc., Chests, with Tools....25%
Machinists' and Pipe Fitters' Chests, Empty....50%
Tool Cabinets....50%
C. E. Jennings & Co.'s Machinists' Tool Chests....33⅓&10%

Chisels—
Socket Framing and Firmer
Standard List....75&10@75&10&5%
Buck Bros....30%
Charles Buck....30%
C. E. Jennings & Co. Socket Firmer No. 10....60%
C. E. Jennings & Co. Socket Framing No. 15....60%
Ohio Tool Co.'s....70%
Swan's....75%
L. & I. J. White....30@30&5%
L. & I. J. White, Tanged....25&5%

Tanged—
Tanged Firmers....33 1-3@40%
Buck Bros....30%
Charles Buck....30%
C. E. Jennings & Co. Nos. 191, 181..25%

Cold—
lb.
Cold Chisels, good quality..13@15¢
Cold Chisels, fair quality..11@12¢
Cold Chisels, ordinary...9@10¢

Chucks—
Almond Drill Chucks....35%
Almond Turret Six-Tool Chuck....35%
Beach Pat., each $8.00....35&5%
Empire....25%
Blacksmiths'....25%
Jacobs' Drill Chucks....35%
Pratt's Positive Drive....25%
Skinner Patent Chucks:
Independent Lathe Chucks....40&10%
Universal, Reversible Jaws....40%
Combination, Reversible Jaws....40%
Drill Chucks, New Model....25%
Drill Chucks, Standard....40&10%
Drill Chuck, Skinner Pat....25%
Drill Chucks, Positive Drive....33⅓%
Planer Chucks....30%
Face Plate Jaws....40&10%
Standard Tool Co.:
Improved Drill Chuck....45%
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17....40%
Combination, No. 21....35%
Scroll Combination, Nos. 82 and 84....30%
Geared Scroll, Nos. 33, 34 and 35..35%
Independent Iron, Nos. 18 and 318..40%
Independent Steel, No. 64....30%
Union Czar Drill, Nos. 000, 101, 103....35%
Universal 11, 12, 16, 17, 13, 14, 15..40%
Universal, No. 42....35%
Iron Face Plate Jaws, Nos. 28, 30, 48 and 50....40%
Steel Face Plate Jaws, Nos. 70 and 72....35%
Westcott Patent Chucks:
Lathe Chucks....50%
Little Giant Auxiliary Drill....50%
Little Giant Double Grip Drill..50%
Little Giant Drill, Improved....50%
Oneida Drill....50%
Scroll Combination Lathe....50%

Clamps—
Adjustable, Hammers'....20@20&5%
Cabinet, Sargent's....50&10%
Carriage Makers', P., S. & W. Co....40&10@50%
Carriage Makers', Sargent's....60%
Besly, Parallel....33⅓&10%
Lineman's, Utica Drop Forge & Tool Co....40%
Wood Workers, Hammers'....40&10%
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain—
Iwan's Champion, Adjustable....55%
Iwan's Champion, Stationary....47%

Sidewalk—
Star Socket, All Steel..₱ doz. $4.95 net
Star Shank, All Steel..₱ doz. $3.24 net
W. & C. Shank, All Steel, ₱ doz., 7½ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—
Foster Bros....30%
Fayette R. Plumb....30%
L. & I. J. White....30%

Clippers, Horse and Sheep—
Chicago Flexible Shaft Company:
'98 Chicago Horse, each....$8.75
1902 Chicago Horse, each..$10.75
20th Century Horse, each..$5.00
Lightning Belt Horse, each.$15.00
Chicago Belt Horse, each.$20.00
Stewart's Enclosed Gear Horse, each....$6.75
Stewart's Patent Sheep Shearing Machine, each....$12.75
} 20%

Clips, Axle—
Regular Styles, list July 1, '05.80%

Cloth and Netting, Wire
—See *Wire, &c.*

Cocks, Brass—
Hardware list:
Compression, Plain Bibbs, Globe, Kerosene, Racking, &c., Cocks....70@70&10&5%

Coffee Mills—
See *Mills, Coffee.*

Collars, Dog—
Nickel Chain, Walter B. Stevens & Son's list....40%
Leather, Walter B. Stevens & Son's list....40%

Combs, Curry—
Metal Stamping Co....40%

Mane and Tail—
Covert's Saddlery Works....60&10%

Compasses, Dividers, &c.
Ordinary Goods....75&5@75&10%
Bemis & Call Hdw. & Tool Co.:
Dividers....65%
Calipers, Double....65%
Calipers, Inside or Outside....65%
Calipers, Wing....60%
Compasses....50%
Wm. Schollhorn Co.:
Excelsior Dividers....60%
Lodi Dividers....75%

Conductor Pipe,—
L. C. L. to Dealers:

Territory:	*Galvanized*		*Copper.*
	Galv. Steel.	*Charcoal Iron.*	*14, 16&20 oz.*
Eastern:			
	70&10%	*60&7½%*	*40&10%*
Central:			
	70&21½%	*60%*	*40&7½%*
Western and Southern:			
	65&10%	*50&10&21½%*	*40&5%*

Galvanized

	Galv. Steel.	*Charcoal Iron.*	*Copper. 14, 16&20 oz.*
So. Western			
	62½&7½%	*50&5%*	*40&21½%*

Terms, 60 days; 2% cash 10 days. Factory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

Gal. each..	2	3	4	6	8
Labrador	$1.20	$1.50	$1.80	$2.10	$2.70
Gal.	3	4	6	8	
Iceland, ea.	$1.80	$2.10	$2.40	$3.00	
Gal.	2	3	4	6	8
Galvanized, ea.	$1.85	$2.00	$2.25	$2.90	$3.90
Galvanized, Lined, side handles, Gal.	2	3	4	6	8
Each	$1.95	$2.15	$2.40	$3.30	$4.15
White Enameled	25%				
Agate Lined	25%				

Coopers' Tools—
See *Tools, Coopers'.*

Coppers' Soldering—
Soldering Coppers, 3 lbs. to pair and heavier, 23@24¢; lighter than 3 lbs. to pair....25@26¢

Cord—Sash—
Braided, Drab....lb. 35¢
Braided, White, Com., Nos. 8 to 12, 24¢; No. 7, 24½¢; No. 6, 25½¢.
Cable Laid Italian....lb., A, 18¢; B, 16¢
Common India....lb. 10@10½¢
Cotton Sash Cord, Tw'ted..17@19¢
Patent Russia....lb...@14¢
Cable Laid Russia....lb...@15¢
India Hemp, Braided..lb...@18¢
India Hemp, Twisted..lb. 12@13¢
Patent India, Twisted..lb. 12@13¢
Anniston Cordage Co.: ₱ lb, solid Braided, Nos. 8 to 12, $0.24; No. 7, $0.24½; No. 6, $0.25½; ₱ doz., 50 ft., Oriole, $2.00; 50 ft., Columbia, $0.85; 50 ft., Victors, $1.00; 50 ft., 6-Thread, $1.10; 60 ft., 3-Thread, $0.95; 50 ft., Manila, $1.40; 60 ft., Jute, $0.75.
Pearl Braided, cotton, No. 6, ₱ lb, 25½¢; No. 7, 25¢; Nos. 8 to 12, 24½¢
Eddystone Braided, Nos. 8, 9 and 10, 25¢; 7, 25½¢; 6, 26½¢
Harmony Cable Laid Italian, Nos. 7 to 10....₱ lb 23 ¢
Peerless:
Cable Laid Italian....16 ¢
Cable Laid Russian....14 ¢
Cable Laid India....12 ¢
Braided India....18 ¢
Pullman:
Wire Sash Cord....10%
Sash Cord Attachments, per doz.10¢
Samson, Nos. 8 to 12:
Braided, Drab Cotton....₱ lb 40 ¢
Braided, Italian Hamp....₱ lb 40 ¢
Braided, Linen....₱ lb 35 ¢
Braided, White Cotton or Spot....₱ lb 35 ¢
Massachusetts, White....₱ lb 30 ¢
Massachusetts, Drab....₱ lb 35 ¢
Phoenix, White, Nos. 8 to 12, 27¢; No. 7, 27½¢; No. 6, 28½¢.
Silver Lake:
A, Drab....45 ¢
A, White....40 ¢
B, Drab....40 ¢
B, White....35 ¢
Italian Hemp....40 ¢
Linen....57½¢
See also Chain and Ribbon.

Wire, Picture—
List Oct., '00....85&10&10@85&10&10&5%
Hendryx Standard Wire Picture Cord, 85&10%

Cradles—
Grain....40&12½%

Crayons—
White Round Crayons, gr. 6@6½¢
Cases, 100 gro., $5.00 at factory.

D. M. Steward Mfg. Co.:
Genuine. Per gro.
Round Pencil, $2.25; Square Pencil, $1.75; Flat Crayon, $2.50; Metal Workers' Crayon, $3.00; Rolling Mill Crayon, $3.00.

Compo. Per gro.
Round Pencil, $1.50; Square Pencil, $1.50; Flat Crayon, $1.50; Metal Workers' Crayon, $2.50; Rolling Mill Crayon, $2.50; Railroad Crayon, $4.00; Compo. Crayon, $4.00.

} Case lots, 50&20%; Case lots, 20%

Zelnicker's Lumber:
Red, Blue, Green....₱ gro. $6.50
Black....₱ gro. $4.00
See also Chalk.

Crooks, Shepherds'—
Fort Madison, Heavy....₱ doz. $7.00
Fort Madison, Light....₱ doz. $6.50

Crow Bars—See *Bars, Crow.*

Cultivators—
Victor Garden....50%

Cutlery, Table—
International Silver Company:
No. 12 M'd'm Knives, 1847..₱ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor....₱ doz. $3.00
Wm. Rogers & Son....₱ doz. $2.50

Cutters—Glass—
H. H. Mayhew Co....40%
Red Devil....50%
Smith & Hemenway Co....50%
Woodward....40%

Meat and Food—
American....30%

Nos.	1	2	3	4	B	5
Each	$5	$7	$10	$25	$50	$60

Enterprise:

Nos.	5	10	12	22	32	
Each	$2	$3	$2.75	$4.50	$6	25@25&7½%

No. 202, $1.50....40&7½%
Dixon's....₱ doz. 40@50%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Ideal....40&10@50%
Little Giant....₱ doz. 40@50%

Nos.	305	310	312	320	322
	$35.00	$48.00	$44.00	$72.00	$88.00

N. E. Food Choppers....25%
New Triumph No. 605, ₱ doz. $24.00....40@50%
Russwin Food, No. 1, $24.00; No. 2, $27.00....45&10&10%
Woodruff's....₱ doz. 40@50%

Nos.	100	150
	$15.00	$18.00

Enterprise Beef Shavers....25@30%

Slaw and Kraut—
Henry Disston & Sons:
Slaw, Corn Grater, &c....40%
Kraut Cutters, 24 x 7, 26 x 8, 30 x 9....55%
Kraut Cutters, 36 x 12, 40 x 12....40%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife....₱ doz. $3.00
Combined Slaw Cutter and Corn Grater....₱ doz. $4.00
Tucker & Dorsey Mfg. Co.:
Kraut Cutters....40%
Slaw Cutters, 1 Knife..₱ gr. $18@$20
Slaw Cutters, 2 Knife..₱ gr. $22@$30

Tobacco—
All Iron, Cheap..doz. $4.25@$4.50
Enterprise....25@30%
National, ₱ doz., No. 1, $21; No. 2, $18....40%
Sargent's, ₱ doz., No. 2....60%
Sargent's, Nos. 12 and 21....60&10%

Washer—
Appleton's, ₱ doz., $16.00....50&10&10%

Diggers, Post Hole, &c.—
Dalbey Post Hole Auger..per doz. $9.00
Iwan's Imp'ved Post Hole Auger.40&5%
Iwan's Vaughan Pattern Post Hole Augers....₱ doz. $6.25
Iwan's Perfection Post Hole Digger....₱ doz. $8.25
Iwan's Split Handle Post Hole Diggers....₱ doz. $7.25
Kohler's Universal....₱ doz. $14.00
Kohler's Little Giant....₱ doz. $12.00
Kohler's Hercules....₱ doz. $10.00
Kohler's Invincible....₱ doz. $9.00
Kohler's Rival....₱ doz. $8.00
Kohler's Pioneer....₱ doz. $7.00
Never-Break Post Hole Diggers, ₱ doz., $24.00....60%
Samson, ₱ doz. $34.00....25%

Dividers—See *Compasses.*

Drawers, Money—
Tucker's Pat. Alarm Till No. 1, ₱ doz., $18; No. 2, $15; No. 3, $12; No. 4, $18.

Drawing Knives—
See *Knives, Drawing.*

Dressers, Emery Wheel—
Diamond Emery Wheel Dressers....35%
Diamond Wheel Dresser Cutters....35%

Drills and Drill Stocks—
Common Blacksmiths' Drill, each....$1.50@$1.75
Breast, Millers Falls....15&10%
Breast, P., S. & W....40%
Goodell Automatic Drills..40&5@40&10%
Johnson's Automatic Drills, Nos. 2 and 3....16⅔%
Johnson's Drill Points....16⅔%
Millers Falls Automatic Drills.33⅓&10%
Ratchet, Curtis & Curtis....25%
Ratchet, Parker's....40%
Ratchet, Weston's....40%
Ratchet, Weston's, Style H Improved....40%
Ratchet, No. 012....40%
Ratchet, Whitney's, P., S. & W..50%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00....33⅓%

Twist Drills—
Bit Stock....60&10&10@70%
Taper and Straight Shank....60&10@60&10&5%

Drivers, Screw—
Screw D'ver Bits, per doz..45@50¢
Balsey's Screw Holder and Driver, ₱ doz., 2½-in., $6; 4-in., $7.50; 6-in., $9....50%
Buck Bros.' Screw Driver Bits....30%
Champion....50%
Edson....60%
Fray's Hol. H'dle Sets, No. 3, $12..50%
Gay's Double Action Ratchet....35%
Goodell's Auto..50&10&10@50&10&10&5%
Hurwood....40%
Mayhew's Black Handle....40%
Mayhew's Monarch....40&10%
Millers Falls, Nos. 20 and 21....25&10%
Millers Falls, Nos. 11, 12, 41, 42..15&10%
New England Specialty Co....50&10%
Sargent & Co.'s:
Nos. 1 and 60....50&10&10%
Nos. 50, 53 and 55....60&10%
Nos. 20 and 40....70&10%
Smith & Hemenway Co....40&5%
H. D. Smith & Co.'s Perfect H'dle..40%
Stanley R. & L. Co.'s:
No. 64, Varn. Handles....65%
No. 90....75%
Victor....55%
Defiance....70%
Swan's:
Nos. 7563 to 7568....52%
No. 7540....40&10%

Eave Trough, Galvanized—
Territory. L. C. L. Galvanized

	Galv. Steel.	*Charcoal Iron.*	*Copper. 14, 16&20 oz.*
Eastern:			
	80&21½%	*70&7½%*	*40&10%*
Central:			
	75&10&7½%	*70%*	*40&7½%*
Western and Southern:			
	70&20&7½%	*60&15&21½%*	*40&5%*
So. Western:			
	70&20%	*65&21½%*	*40&21½%*

Terms.—2% for cash. Factory shipments generally delivered.
See also Conductor Pipe and Elbows.

Elbows and Shoes—
Factory shipments, all territories: Galv. Steel and Galv. C. I.
Gauge....60&10%
No. 26....50%

No. 24.....25%
No. 22.....10%
Copper.....50%

Elbows, Stove Pipe—

Dover, one piece.....40%
Perfect Elbows (R. M. Co.).....40%

Emery, Turkish—

	4 to 46	5 to 220	Flour.
Kegs.....lb.	5 ¢	5½ ¢	5½ ¢
½ Kegs.....lb.	5¼ ¢	5¾ ¢	5¾ ¢
¼ Kegs.....lb.	5½ ¢	6 ¢	6 ¢
10-lb. cans, 10 in case....	6½ ¢	7 ¢	6 ¢
10-lb. cans, less than 10.....	10 ¢	10 ¢	8 ¢
Less quantity..	10 ¢	10 ¢	8 ¢

NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extractors, Lemon Juice

—See *Squeezers, Lemon.*

Fasteners, Blind—

Zimmerman's.....50&10%
Walling's.....40&10%

Cord and Weight—

Ives.....40%

Faucets—

Cork Lined.....50@50&10%
Metallic Key, Leather Lined..60&10@70%
Red Cedar.....40&10@50%
Petroleum.....70&10@75%
B. & L. B. Co.:
Metal Key.....60&10%
Star.....60%
West Lock.....60&10%
John Sommer's Peerless Tin Key.....40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Mtl. Key.50&10%
John Sommer's Duplex Metal Key..60%
John Sommer's Diamond Lock.....40%
John Sommer's I. X. L. Cork Lined...50%
John Sommer's Reliable Cork Lined..50&10%
John Sommer's Chicago Cork Lined.60%
John Sommer's O. K. Cork Lined...50%
John Sommer's No Brand, Cedar....50%
John Sommer's Perfection, Cedar....40%
McKenna, Brass:
Burglar Proof, N. P.....25%
Improved, ¾ and ⅞ inch.....25%
Self Measuring:
Enterprise, ℔ doz. $36.00.....40&10%
Lane's, ℔ doz. $36.00.....40&10%
National Measuring, ℔ doz. $36.40&10%

Felloe Plates—

See *Plates, Felloe.*

Files— Domestic—

List revised Nov. 1, 1899.
Best Brands.....70&10@75&10%
Standard Brands.75&10@75&10&10%
Lower Grade....75&10&10@80&10%

Imported—

Stubs' Tapers, Stubs' list, July 24, '97.....33 1-3@40%

Fixtures, Fire Door—

Richards Mfg. Co.:
Universal, No. 103.....$3.75
Special, No. 104.....$3.75
Fusible Links, No. 96.....50%
Expansion Bolts, No. 107.....60&10%

Grindstone—

Net Prices:

Inch.....	15	17	19	21
Per doz.....	$3.25	3.75	4.25	4.75

P., S. & W. Co.....30&10@40%
Reading Hardware Co.....60%
Sargent's.....75%
Stowell's Giant Grindstone Hanger.. ℔ doz. $6.00
Stowell's Grindstone Fixtures, Extra Heavy.....50&10&10%
Stowell's Grindstone Fixtures, Light.

Fodder Squeezers—60&10%

See *Compressors.*

Forks—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Iowa Dig-Ezy Potato.....60&10%
Victor, Hay.....60&15&2½%
Victor, Manure.....66⅔%
Victor, Header.....66⅔%
Champion, Hay.....66⅔%
Champion, Header.....66⅔%
Champion, Manure.....60&15&2½%
Columbia, Hay.....60&20%
Columbia, Manure.....70%
Columbia, Spading.....70&12½%
Hawkeye Wood Barley.....40%
W. & C. Potato Digger.....60&10%
Acme Hay.....60&20%
Acme Manure, 4 tine.....60&10&5%
Dakota Header.....60&20%
Jackson Steel Barley.....60&20%
Kansas Header.....65%
W. & C. Favorite Wood Barley.....40%
Plated.—See Spoons.

Frames— Saw—

White, S'g't Bar, per doz..75@80¢
Red, S'g't Bar, per doz...$1.00@1.25
Red, Dbl. Brace, per doz.$1.40@1.50

Freezers, Ice Cream—

Qt......	1	2	3	4	6
Each....	$1.30	$1.60	$1.90	$2.20	$2.80

Fruit and Jelly Presses—

See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*

Hemp.....$2.75
Cotton.....3.20
Waterproof Sgl. Taped..3.65
Waterproof Dbl. Taped..4.40
Waterproof Tpl. Taped..5.15

10&5%

Gates, Molasses and Oil—

Stebbins' Pattern.....80&10%

Gauges—

Marking, Mortise, &c..50&10@60%
Chapin-Stephens Co.:
Marking, Mortise, &c.50&10@50&10&10%
Scholl's Patent.....50&10@50&10&10%
Door Hangers.....50@50&10%
Stanley R. & L. Co.'s Butt and Rabbet Gauge.....35%
Marking and Mortise.....60%
Wire, Brown & Sharpe's.....25%
Wire, Morse's.....25%
Wire, P., S. & W. Co.....33⅓%

Gimlets— Single Cut—

Numbered assortments, per gro.
Nail, Metal, No. 1, $2.00; 2, $2.30
Spike, Metal, No. 1, $4.00; 2, $4.30
Nail, Wood Handled, No. 1, $2.30; 2, $2.60
Spike, Wood Handled, No. 1, $4.30; 2, $4.60

Glass, American Window

See *Trade Report.*

Glasses, Level—

Chapin-Stephens Co.....60@60&10&10%

Glue, Liquid Fish—

Bottles or Cans, with Brush..25&10@50%
International Glue Co. (Martin's)..40%

Grease, Axle—

Common Grade....*gro. $4.50@6.00*
Dixon's Everlasting..10-lb pails, ea. 85¢
Dixon's Everlasting, in boxes, ℔ doz. 1 lb, $1.20; 2 lb, $2.00
Helmet Hard Oil.....25%

Griddles, Soapstone—

Pike Mfg. Co.....33⅓@33⅓&10%

Grindstones—

Bicycle Emery Grinder.....$6.50
Bicycle Grindstones, each.....$2.50@3.00
Pike Mfg. Co.:
Improved Family Grindstones, per inch, ℔ doz.....$2.00
Pike Mower and Tool Grinder, each.....$6.00

Grips, Nipple—

Perfect Nipple Grips.....40&10&2%

Halters and Ties—

Cow Ties.....60&10@60&10&5%
Covert Mfg. Co.:
Web.....45%
Jute Rope.....45%
Sisal Rope.....33⅓%
Cotton Rope.....45%
Hemp Rope.....45%
Covert's Saddlery Works:
Web and Leather Halters.....70%
Jute and Manila Rope Halters.....70%
Sisal Rope Halters.....50&20%
Jute, Manila and Cotton Rope Ties.....70%
Sisal Rope Ties.....60&10%
Oneida Community:
Am. Coil and Halters.....40@40&5%
Am. Cow Ties.....45&50%
Niagara Coil and Halters..45@60&5%
Niagara Cow Ties....45&5@50&10&5%
E. T. Rugg & Co.:
Leather Halters.....50%
Web Halters and Webbing.....60%
Jute and Sisal Rope Halters.....60%
Jute and Sisal Horse and Cattle Ties.....60%
Cotton Horse Ties.....60%
Livery Ties, Braided.....60%

Hammers—

Handled Hammers—

Heller's Machinists'...40&10@40&10&10%
Heller's Farriers.....40&10@40&10&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25, $1.50, $1.75.....50%
Peck, Stow & Wilcox, Steel.....50%
Fayette R. Plumb:
Plumb, A. E. Nail.....33⅓&7½@33⅓&10&7½%
Engineers' and R. S. Hand.....50&7½&5@50&10&7½&5%
Machinists' Hammers.50&5@50&10&5%
Riveting and Tinners'.....40&2½@40&10&2½%
Sargent's C. S. New List.....40%

Heavy Hammers and Sledges—

Under 3 lb., per lb., 50¢...80&10%
3 to 5 lb., per lb., 40¢.....80&10%
Over 5 lb., per lb., 30¢..80&10&10%
Wilkinson's Smiths'...lb. 9½@10¢

Handles—

Agricultural Tool Handles

Axe, Pick, &c....60&10@60&10&5%
Hoe, Rake, &c.....45@50%
Fork, Shovel, Spade, &c.:
Long Handles.....45@50%
D Handles.....50@50&5%

Cross-Cut Saw Handles—

Atkins'.....40%
Champion.....45@45&10%
Disston's.....50%

Mechanics' Tool Handles—

Auger, assorted...*gro. $2.50@$3.00*
Brad Awl.....*gro. $1.65@$1.75*
Chisel Handles:
Apple Tanged Firmer, gro. assorted.....$2.40@$2.65
Hickory Tanged Firmer, gro. assorted.....$2.15@$2.40
Apple Socket Firmer, gro. assorted.....$1.75@$1.95
Hickory Socket Firmer, gro. assorted.....$1.45@$1.60
Hickory Socket Framing, gro. assorted.....$1.60@$1.75
File, assorted.....gro. $1.30@$1.40
Hammer, Hatchet, &c.
60&10@60&10&5%
Hand Saw, Varnished, &c.
80&85¢; *Not Varnished*...65@75¢
Plane Handles:
Jack, doz. 30¢; Jack, Bolted.75¢
Fore, doz. 45¢; Fore, Bolted.90¢
Chapin-Stephens Co.:
Carving Tool.....40@40&10%
Chisel.....65@65&10%
File and Awl.....65@65&10%
Saw and Plane.....40@40&10%
Screw Driver.....40@40&10%
Millers Falls Adj. and Ratchet Auger Handles.....15&10%
Nicholson Simplicity File Handle.... ℔ gro. $0.85@$1.50

Hangers—

NOTE.—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c

Allith Mfg. Co.:
Reliable, No. 1.....per doz. $2.00
Reliable, No. 2.....per doz. $2.00
Chicago Spring Butt Co.:
Friction.....25%
Oscillating.....25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator.....30%
Railroad.....50%
Cronk & Carrier Mfg. Co.:
Loose Axle.....60&10%
Roller Bearing.....70%
Griffin Mfg. Co.:
Solid Axle, No. 19, $12.00.....70%
Roller Bearing, No. 11, $15.00.70%
Roller Bearing, Ex. Hy., No. 22, $18.00.....70%
Hinged Hangers, $16.00....60&10%
Lane Bros. Co.:
Parlor, Ball Bearing.....$4.00
Parlor, Standard.....$3.15
Parlor, No. 105.....$2.85
Parlor, New Model.....$2.80
Parlor, New Champion.....$2.25
Barn Door, Standard.....60&5%
Hinged.....net $6.40
Covered.....60&2%
Special.....70&5%
Lawrence Bros.:
Advance.....60&10%
Cleveland.....75%
Clipper, No. 75.....60%
Crown.....60&10%
Easy Parlor Door, Dbl. Sets, $2.50; Single Sets, $1.25.
Giant.....60&5%
Hummer.....70&5%
New York.....60&10%
Peerless.....75%
Sterling.....60&10%
McKinney Mfg. Co.:
No. 1, Special, $15.....60&10%
No. 2, Standard, $18.....60&10%
Hinged Hangers, $16.....50%
Meyers' Stayon Hangers.....60&5%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, 60&5%
Pioneer Wood Track No. 3..$4.00
Ball B'r'g St'l Track No. 10,50&10%
Roller B'r'g St'l Track No. 12.$2.15
Roller B'r'g St'l Track No. 13.$2.30
Roller B'r'g, Nos. 39, 41, 43, 70&10%
Hero, Adj. Track No. 19..50&10%
Adjustable Track Tandem Trolley Track No. 16.....50&10%
Seal, Steel Track No. 8.....$2.25
Auto Adj. Track No. 22..50&10%
Trolley B. D. No. 17.....$1.25
Trolley F. D. No. 120.....$2.10
Trolley F. D. No. 121.....$2.25
Trolley F. D. No. 150.....$2.50
Safety Underwriters F. D. No. 101 } Extra 10% often given.
Tandem No. 44..2½ and 3 60&10%
Palace, Adjustable Track No. 132.....50&10%
Royal, Adjustable Track No. 122.....50&10%
Ives' Wood Track No. 1.....$2.00
Trolley B. D. No. 20.....50&10%
Trolley B. D. No. 24.....$1.30
Trolley B. D. No. 27.....$1.40
Trolley B. D. No. 28.....$1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43; 44, Sizes 1 and 2..70&10%
Anti-friction, No. 42.....60&10%
Anti-friction, No. 44, Sizes 2½ and 3.....60&10%
Hinged Tandem No. 48....60&5%
Folding Door B. B. Swivel No. 136.....40%
Safety Door Hanger Co.:
Storm King Safety.....60%
U. S. Standard Hinge.....60%
Stowell Mfg. & Foundry Co.:
Acme Parlor Ball Bearing....40%
Ajax Hinge Door.....60%
Apex Parlor Door.....50&10&5%
Atlas.....60%
Baggage Car Door.....50%
Climax Anti-Friction.....50&10%
Elevator.....40%
Express.....50%
Freight Car Door.....60%
Interstate.....60&10%
Lundy Parlor Door.....50&10%
Magic.....60%
Matchless.....60&10%
Nansen.....70&5%
Parlor Door.....50&10%
Railroad.....50&10%
Rex Hinge Door.....60%
Street Car Door.....50%
Steel, Nos. 300, 404, 500....50&10%
Underwriters' Fire Door.....40%
Wild West Warehouse Door..50%
Zenith for Wood Track....50&10%
A. L. Sweet Iron Works:
Check Back.....70%
Climax Anti-Friction.....50&10%
Eagle.....70%
Hylo Hinge.....60%
New Perfection.....60%
Pilot.....60%
Pilot Hinge.....60%
Rider Wooster.....65%
Western Pattern.....70%
Taylor & Boggis F'y Co.'s Kidder's Roller Bearing.50&15&10&5%

Hangers— Garment—

Pullman Trouser, ℔ gro., 1 pair Flat Aluminoy, $9.00; 1 pair Round Nickeled, $9.00; 4 pair Round Nickeled, $27.00; 1 pair Flat Gun Metal, $12.00; 1 pair Flat Black Enameled, $7.50; 1 pair Wood Clamp, $13.00; Skirt Hangers, Folding, per gro., $21.00; Coat Hangers, Folding, per gro., $8.00; Garment Hanger Rods, Round Nickeled, per gro., $15.00; Garment Hanger Loops, Round Nickeled, per gro.....$15.00
Victor Folding.....℔ gro. $9.00
Western, W. G. Co.....70&10%

Gate—

Myers' Patent Gate Hangers, ℔ doz. net.....$4.50

Joist and Timber—

Lane Bros. Co.....30%

Hasps—

Griffin's Security Hasp.....50%
McKinney's Perfect Hasp, ℔ doz..50%

Hatchets—

Regular list, first quality....50%
Second quality $1.00 per doz. less than first quality.

Heaters, Carriage—

Clark, No. 5, $1.75; No. 5B, $2.00; No. 3, $2.25; No. 3D, $2.75; No. 7D, $3.00; No. 3E, $3.25; No. 1, $3.50.....15%
Clark Coal, ℔ doz. $0.75.....10%

Hinges—

Blind and Shutter Hinges—

Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No......	1	3	5
Doz. pair.....	$0.75	1.35	2.70

Mortise Shutter: (L. & P., O. S., Dixie, &c.)

No......	1	1½	2	2½
Doz. pair.....	$0.70	.65	.60	.55

Mortise Reversible Shutter (Buffalo, &c.):

No......	1	1½	2
Doz. pair.....	$0.70	.65	.60

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Charles Parker Co.....70@75%
Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind Hinges.....20%
Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00.....20%
Reading's Gravity.....60%
Sargent's, Nos. 1, 3, 11 and 13..75&10%
Stanley's Steel Gravity Blind Hinges, ℔ doz. sets, without screws, $0.90; with screws, $1.20.
Wrightsville Hardware Co.:
O. S., Lull & Porter.....75&10&5%
Acme, Lull & Porter.....75&10%
Queen City Reversible.....75&10%
Shepard's Noiseless, Nos. 60 65, 85.....75&10%
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75&10&5%
1868, Old Pat'n, Nos. 1, 3 & 5.... 75&10&5%
Tip Pat'n, Nos. 1, 3 & 5....75&10&5%
Buffalo Gravity Locking, Nos. 1, 3 & 5.....75&10&5%
Shepard's Double Locking, Nos. 20 & 25.....70%
Champion Gravity Locking, No. 75.75%
Steamboat Gravity Locking, No. 10.75%
Pioneer, Nos. 060, 45 & 5½.....75%
Empire, Nos. 101 & 105.....70%
W. H. Co.'s Mortise Gravity Locking, No. 2.....60%

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No......	1	2	3
Hinges with L't'chs.	$2.00	2.70	5.00
Hinges only.....	1.40	2.05	3.80
Latches only.....	.70	.70	.35

New England:
With Latch.....*doz.*....@$2.00
Without Latch...*doz.*....@$1.60
Reversible Self-Closing:
With Latch.....*doz.*....@$1.75
Without Latch...*doz.*....@$1.35
Western:
With Latch.....*doz. $1.75*
Without Latch.....*doz. $1.15*
Wrightsville Hardware Co.:
Shepard's or Clark's, doz. sets,

	Nos. 1	2	3
Hinges with Latches..	$2.00	2.70	5.00
Hinges only.....	1.40	2.05	3.80
Latches only.....	.70	.70	1.35

Pivot Hinges—

Bommer Bros. Pivot.....40%
Lawson Mfg. Co. Matchless.....45%

Spring Hinges—

Holdback, Cast Iron...*$6.50@$7.00*
Non-Holdback, Cast Iron$6.25@$6.75
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges.....45%
Bardsley's Patent Checking..15%
Bommer Bros.:
Bommer Ball Bearing Floor Hinges.....40%
Bommer Spring Hinges.....40%
No. 999 Wrot, Steel Hold Back, ℔ gr. $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges.....25%
Triple End Spring Hinges....50%
Chicago (Ball Bearing) Floor Hinge.....50%
Garden City Engine House....25%
Keene's Saloon Door.....25%
Columbian Hardware Co.:
Acme, Wrought Steel.....30%
Acme, Brass.....25%
American.....30%
Columbia, No. 14.....℔ gr. $9.00
Columbia, No. 18.....℔ gr. $25.00
Columbia, Adjustable, No. 7, ℔ gr. $12.00
Gem, new list.....30%
Clover Leaf.....℔ gr. $12.00
Oxford, new list.....30%
Lawson Mfg. Co., Matchless....30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges.....40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door.....℔ gr. $9.00
Ball Bearing Floor Hinge....50%
Ohio Detachable Screen Door Hinge.....℔ gr. $12.00
Superior Spring Hinge Co.:
Superior Floor Hinges.....33⅓%
The Stover Mfg. Co.:
Ideal, No. 16, Detachable, ℔ gr. $12.50
Ideal, No. 4.....℔ gr. $9.00
New Idea, No. 1.....℔ gr. $9.00
New Idea, Double Acting....45%
New Idea Floor.....45%
Van Wagoner:
Ball Bearing.....25%
No. 777 Sh't Steel Holdb'k.℔ gro. pr.$9

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—

Strap and T Hinges, &c., list December 20, 1904:
Light Strap Hinges...65%
Heavy Strap Hinges..75%
Light T Hinges.....60%
Heavy T Hinges.....55%
Extra H'y T Hinges..70%
Hinge Hasps.....45%
Cor. Heavy Strap....75%
Cor. Ex. Heavy T..70&10%

Extra, 10&5% 10&10%

Screw Hook and Strap. { *6 to 12 in..lb.3¾¢; 14 to 20 in..lb.3½¢; 22 to 36 in..lb.3¼¢*

Screw Hook and Eye:
¾ to 1 inch.....lb.6½¢
⅝-inch.....lb.7½¢
½-inch.....lb.8½¢

Hitchers, Stall—
Covert Mfg. Co., Stall Hitchers..30&2½%

Hods— Coal—
	Per doz.			
Inch	*15*	*16*	*17*	*18*
Galv. Open	*$2.50*	*2.75*	*3.00*	*3.25*
Jap. Open	*$1.90*	*2.10*	*2.25*	*2.55*
Galv. Funnel	*$3.00*	*3.30*	*3.60*	*3.90*
Jap. Funnel	*$2.45*	*2.65*	*2.85*	*3.30*

Masons' Etc.—
Cleveland Wire Spring Co.:
Steel Brick, No. 162.....each $0.95
Steel Mortar, No. 158.....each $1.25

Hoes— Eye—
Scovil and Oval Pattern.....60&10@60&10&10%
Grub, list Feb. 23, 1899.....70&10@75&10%
D. & H. Scovil.....33⅓%

Handled—
NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Cronk's Weeding No. 1, $2.00; No. 2, $2.25
Ft. Madison Cotton Hoe....70&10&10%
Ft. Madison Crescent Cultivator Hoe, ℔ doz.....70&10%
Ft. Madison Mattock Hoes:
Regular Weight.....℔ doz. 66⅔%
Junior Size.....℔ doz. $4.00
Ft. Madison Sprouting Hoe...℔ doz. 50%
Ft. Madison Dixie Tobacco Hoe.....75&10&7½%
Kretsinger's Cut Easy.....70&10%
Warren Hoe.....45&10%
W. & C. Ivanhoe.....75&2%
R. R. 6 in., Cultivator Hoe.....$3.15
R. B., 6½ in.....$3.35
Acme Wedding.....℔ doz., net, $4.35
W. & C. L'tning Shuffle Hoe, ℔ doz. $4.85

Hoisting Apparatus—
See *Machines, Hoisting.*

Holders— Bit—
Angular, ℔ doz. $24.00.....45&10%

Door—
Bardsley's.....45%
Empire.....50%
Pullman.....50%
Superior.....33⅓%

File and Tool—
Nicholson File Holders and File Handles.....33⅓&40%

Fruit Jar—
Triumph Fruit Jar Holder, ℔ gross, $10.80; ℔ doz.....$1.25

Hones—Razor—
Pike Mfg. Co., Belgian, German and Swaty.....40%

Hooks—Cast Iron—
Bird Cage, Reading.....40%
Bird Cage, Sargent's List.....60&10%
Ceiling, Sargent's List, Nos. 29, 32, 33, 129, 132, 133 and 135.....50&10&10%
Clothes Line, Reading List.....40%
Clothes Line, Sargent's List.50&20&10%
Coat and Hat, Sargent's List...50&10%
Clothes Line, Stowell's.....70%
Coat and Hat, Reading.....45&20%
Coat and Hat, Stowell's.....70%
Coat and Hat, Wrightsville.....65%
Harness, Reading List.....40%
Harness, Stowell's.....60%
School House, Stowell's.....70%

Wire—
Belt.....60&10@...%
Wire C. & H. Hooks:.....75&10@75&10&10%
Columbian Hdw Co., Gem.....70&10%
Parker Wire Goods Co., King..70&10%
Van Wagoner, Coat and Hat.....70%
Western W. G. Co. Molding.....75%
Wire Goods Co.:
Acme.....60&10%
Chief.....70%
Crown.....75%
Czar.....65%
V Brace.....75%
Czar Harness.....50&10%

Wrought Iron—
Box, 6 in., per doz., $1.90; 8 in., $1.25; 10 in., $2.50.
Cotton.....doz. $1.05@$1.25
Wrought Staples, Hooks, &c.—
See Wrought Goods.

Miscellaneous—
Hooks, Bench, see Stops, Bench.
Bush, Light, doz. $1.75; Medium, $3.35; Heavy, $6.25
Grass, best, all sizes, per doz.$1.60
Grass, common grades, all sizes, per doz.....$1.30
Whiffletree.....lb. 5¾@6¢
Hooks and Eyes:
Brass.....60&5@60&10&5%
Malleable Iron.....70@70&10%
Covert Mfg. Co. Gate and Scuttle Hooks.....40%
Covert Saddlery Works' Self Locking Gate and Door Hook.....60%
Ft. Madison Cut-Easy Corn Hooks, ℔ doz. $3.25 net
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—
See *Nails, Horse.*

Horseshoes—
See *Shoes, Horses.*

Hose, Rubber—
Garden Hose, ¾-inch:
Competition.....ft. 8 @ 6 ¢
3-ply Guaranteed..ft. 8 @ 9 ¢
4-ply Guaranteed..ft. 10 @11 ¢
Cotton Garden, ¾-in., coupled:
Low Grade.....ft. 8 @ 9 ¢
Fair Quality.....ft. 10 @11 ¢

Irons— Sad—
From 4 to 10.....lb. 3 @3½¢
B. B. Sad Irons.....lb. 3¼@3½¢

Mrs. Potts', cents per set:

Nos.	*50*	*55*	*60*	*65*
Jap'd Tops	*63*	*65*	*78*	*75*
Tin'd Tops	*73*	*70*	*83*	*80*

New England Pressing.lb. 3¾@4¢

Pinking—
Pinking Irons.....doz. 60¢

Irons, Soldering
See *Coppers.*

Jacks, Wagon—
Covert Mfg. Co.:
Auto Screw.....30&2%
Steel.....45%
Covert's Saddlery Works:
Daisy.....60&10%
Victor.....60%
Lockport.....50%
Lane's Steel.....30&10&2%
Richards' Tiger Steel, No. 130...50&10%
Smith & Hemenway Co.'s.....25%

Kettles—
Brass, Spun, Plain.....20@25%
Enameled and Cast Iron—See Ware, Hollow.

Knives—
Butcher, Kitchen, &c.—
Foster Bros.' Butcher, &c.....30%
Wilkinson Shear & Cutlery Co.....60%

Corn—
Wilkinson Wilcut Brand Knives and Hooks.....60%
Withington Acme, ℔ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—
Standard List.....75&5@75&10%
C. E. Jennings & Co., Nos. 45, 46..60%
Jennings & Griffin, Nos. 41, 42.....60%
Ohio Tool Co.'s.....70%
Swan's.....75%
Watrous.....16⅔%
L. & I. J. White.....20&5@25%

Hay and Straw—
Serrated Edge, per doz. $5.75@6.00
Iwan's Sickle Edge.....℔ doz. $9.50
Iwan's Serrated.....℔ doz. $10.00

Mincing—
Buffalo.....℔ gro. $13.00

Miscellaneous—
Farriers'.....doz. $3.00@3.25
Westenholm's.....℔ doz. $3.00@3.25

Knobs—
Base, 2½-inch, Birch, or Maple, Rubber Tip.....gro. $1.25@$1.50
Carriage, Jap., all sizes..... gro. 40@45¢
Door, Mineral.....doz. 65@70¢
Door, Por. Jap'd.....doz. 70@75¢
Door, Por. Nickel..doz. $2.05@2.15
Bardsley's Wood Door, Shutters, &c.15%
Picture, Sargent's.....60&10&10%

Lacing, Leather—
See *Belting, Leather—*

Ladders, Store, &c.—
Lane's Store.....25%
Myers' Noiseless Store Ladders....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 113.....50%
Trolley, No. 109.....50%

Ladles, Melting—
L. & G. Mfg. Co. (low list).....25%
P. S. & W.....50%
Reading.....60%
Sargent's.....50&10%

Lanterns—Tubular—
Regular Tubular, No. 0..... doz. $4.25@4.50
Lift Tubular, No. 0..... doz. $4.75@5.00
Hinge Tubular, No. 0..... doz. $4.75@5.00
Other Styles.....40@40&5%

Bull's Eye Police—
No. 1, 2¾-inch.....$2.75@3.00
No. 2, 3-inch.....$3.00@3.25

Lasts and Stands, Shoe—
Stowell's Atlas, Malleable Iron.....50%
Stowell's Badger, Cast Iron.....50%

Latches— Thumb—
Roggin's Latches, with screw.. doz. 35@40¢

Door—
Cronk & Carrier Mfg. Co., No. 101, ℔ doz. $2.00
Cronk & Carrier Mfg. Co., Latch, Hasp and Staples.....50%
Richards' Bull Dog, Heavy, No. 125.....50&5%
Richards' Trump, No. 127.....$1.50

Leaders, Cattle—
Small.....doz. 50¢; large, 60¢
Covert Mfg. Co.:
Cotton, Hemp and Jute, 45%; Sisal, 33⅓%.

Lifters, Transom—
R. & E.....33⅓%

Lines—
Wire Clothes, Nos.	*18*	*19*	*20*
100 feet	*$2.25*	*2.00*	*1.75*
75 feet	*$1.75*	*1.35*	*1.10*

Anniston Waterproof Clothes, 50 ft., ℔ gro., $25.00; Gilt Edge, $23.00; Air Line, $25.00; Acme, $18.00; Alabama, $17.00; Empire, $16.00; Advance, $14.00; Eclipse, $13.50; Chicago, $11.50; Standard, $10.50; Columbia, $9.50; Allston, $13.50; Calhoun, $12.00.
Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50.....℔ gr. 20%
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50.....20%
Tent and Awning Lines: No. 6, White Cotton, $7.50; Drab Cotton, $8.50.....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25.....20%

Locks— Cabinet—
Cabinet Locks..33⅓@33⅓&7½%

Door Locks, Latches, &c.—
NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co.....40%
R. & E. Mfg. Co.....40%
Sargent & Co.....40&10%
Stowell's Steel Door Latches.....50%

Elevator—
Stowell's.....50%

Padlocks—
Wrought Iron....75&10&5@80&5%
Net prices are general.
R. & E. Mfg. Co. Wrought Steel and Brass.....75&10%

Sash, &c.—
Ives' Patent:
Bronze and Brass.....62½%
Crescent.....50&10%
Iron.....62½%
Window Ventilating.....60%
Robison Patent Ventilating Sash Lock.....40%
Wrought Bronze and Brass.....55%
Wrought Steel.....55%
Pullman Patent Ventilating Lock..25%
Reading.....40%

Machines—Boring—
Com. Upr't, without Augers.$2.00
Com. Ang'l'r, without Augers.$2.25
Swan's Improved.....40&10%
Angular.
Jennings', Nos. 1 and 4.....35&5%
Millers' Falls..... 5.75
Snell's, Rice's Pat. 2.50 2.75

Corking—
Roisinger Invincible Hand Power....℔ doz. $48.00

Fence—
Williams' Fence Machines....each, $5.50

Hoisting—
Moore's Anti-Friction Differential Pulley Block.....30%
Moore's Hand Hoist, with Lock Brake.....20%

Ice Cutting—
Chandler's.....12½%

Washing—
Boss Washing Machine Co.:	Per doz.
Boss No. 1	$57.00
Boss Rotary	$54.00
Champion Rotary Banner No. 1	$54.00
Standard Champion No. 1	$48.00
Standard Perfection	$26.00
Cint' Square Western	$30.00
Uneeda American, Round	$30.00

Mallets—
Hickory.....45&5@50%
Lignumvitæ.....45&5@50%
Tinners' Hickory and Applewood.....doz. 45&5@50%

Mangers, Stable—
Swett Iron Works.....50%

Mashers, Vegetable—
Western, W. G. Co., Potato....60&10%

Mats, Door—
Elastic Steel (W. G. Co.), new list..50&10%
Keystone Wire Matting Co.:
Keystone.....50%
Ideal.....50%

Mattocks—
See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—
Enterprise Mfg. Co.....25@30%
National list Jan. 1, 1902.....30%
Parker's Columbia & Victoria.50&10@60%
Parker's Box and Side.....50&10@60%
Swift, Lane Bros. Co.....30%

Mowers, Lawn—
NOTE.—Net prices are generally quoted
Cheapest.....all sizes, $1.85@2.00
Cheap.....all sizes, $2.00@2.50
Better Grade..all sizes, $2.50@4.50

	12	*14*	*16*	*18-in.*
High Grade	*$4.50*	*4.75*	*5.00*	*5.25*

Continental.....50&5%
Great American.....70%
Great American Ball B'r'g, new list..70%
Quaker City.....70%
Pennsylvania.....50&5%
Pennsylvania, Jr., Ball Bearing....60%
Pennsylvania Golf.....50%
Pennsylvania Horse.....33⅓&5%
Pennsylvania Pony.....40&5%
Granite State:
Style A, Low Wheel....70&10&10&5%
Style B, Low Wheel.....70&10&5%
Style C, High Wheel.....70&10%
Style D, High Wheel.....70%
Philadelphia:
Styles M, S, C, K, T.....70&5%
Style A, all Steel.....50&5%
Style E, High Wheel.....70&10&5%
Drexel and Gold Coin, special list.50%

Nails—
Wire Nails and Brads, Miscellaneous.....85&10@85&10&5%
Cut and Wire. See *Trade Report.*
Hungarian, Finishing, Upholsterers' &c. See *Tacks.*

Horse—
Nos.	6	7	8	9	10	
Anchor	23	21	20	19	18	...40&5%
Champlain	28	26	25	24	23	.....50%
Coleman	13	12	12	11	11	.....net
New Haven	23	21	20	19	18	...40&5%

Western.....℔ lb 8½¢
Jobbers' Special Brands..... per lb.9@10¢

Picture—
	1½	2	2½	3	3½ in.	
Brass H'd.	*.45*	*.55*	*.60*	*.70*	*..*	*gro*
Por. Head	*..*	*1.10*	*1.10*	*1.10*	*..*	*gro*

Nippers—
See *Pliers and Nippers.*

Nuts—
Cold Punched: Off list.
Square, Blank or Tapped.. ½ 90@5.00¢
Hexagon, Blank or Tapped.. 5.30@5.40¢
Square, Blank, C. & T.5.20@5.30¢
Hexagon, Blank, C. & T.. 5.90@6.00¢
Hot Pressed.
Square, Blank.....5.10@5.20¢
Hexagon, Blank.....5.50@5.60¢
Square, Tapped.....5.00@5.10¢
Hexagon, Tapped.....5.40@5.50¢

Oakum—
Best.....lb.6¼@6½¢
U. S. Navy.....lb.5¾@6¢
Navy.....lb.4½@5¢
Plumbers' Spun Oakum..2½@3¢
In carload lots ½¢ lb. off, f.o.b. New York.

Oil Tanks—See *Tanks, Oil.*

Oilers—
Brass and Copper.....50&10%
Tin or Steel.....70@70&5%
Zinc.....70@70&5%
Chase or Paragon:
Brass and Copper.....50&10%
Tin or Steel.....65&10%
Zinc.....65&10%
Malleable, Hammers' Imp'ed, Nos. 11, 12 and 13.....20%
Malleable, Hammers' Old Pattern, Nos. 1, 2 and 3.....50%
American Tube & Stamping Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%

Openers— Can— *Per doz.*
Sprague, Iron Handle...30@35¢
Sprague, Wood Handle...35@40¢
Sardine Scissors.....$1.75@$3.00
National.....50&10%
Stowell's Sprague.....℔ doz. 35@45¢
Vim Tin Shear and Can Opener, ℔ doz., 75c.; per gro., $7.50

Egg—
Nickel Plate.....℔ doz., $2.00
Silver Plate.....℔ doz., $4.00

Packing—
Asbestos Packing, Wick and Rope.....17@22¢

Rubber—
(*Fair quality goods.*)
Sheet, C. I.....11@12¢
Sheet, C. O. S.....11@12¢
Sheet, C. B. S.....12@13¢
Sheet, Pure Gum.....40@45¢
Sheet, Red.....40@50¢
Jenkins' '96, ℔ lb 80¢.....25@25&5%

Miscellaneous—
American Packing...lb. 7@10 ¢
Cotton Packing.....lb. 16@25 ¢
Italian Packing.....lb. 9@12½¢
Jute.....lb. 4@ 4½¢
Russia Packing.....lb. 8@11 ¢

Pails, Creamery—
R. M. Co., with gauges—No. 1, $6.25; No. 2, $6.50 ℔ doz.

Pails, Water, Well, &c.—
See *Buckets.*

Pans— Dripping—
Standard List.....65&10%

Fry—
Common Lipped:

Nos.	*1*	*2*	*3*	*4*	*5*
Per doz	*$0.75*	*0.80*	*0.90*	*1.10*	*1.30*

Refrigerator, Galva.—
Inch	*12*	*14*	*16*	*18*
Per doz	*$1.95*	*2.25*	*2.80*	*3.15*

Roasting and Baking—
Regal, R, M, Co., ℔ doz., Nos. 5, $4.50; 10, $5.25; 20, $5.75; 30, $6.25.
Savory, ℔ doz., net, Nos. 200, $9.00; 400, $15.00.
Simplex, ℔ gro.:

No.	40	50	60	140	150	160
	$30.00	35.00	42.00	34.00	39.00	46.00

Paper—Building Paper
Asbestos:	*lb.*	
Roll Board or Building Felt, 6 to 30 lb., per 100 sq. ft.	*6¢*	*Per Roll*
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lbs., per 100 sq. ft.	*8¢*	*Per Roll*
Mill Board, Sheet, 40 x 40 in., 1-32 to ½ in.	*7¢*	*Per Roll*
Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll		*35@40¢*
Medium weight, 30 lbs. to roll,		*40@45¢*
Heavy weight, 40 lbs. to roll..		*56@60¢*
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.		
Deafening Felt, 3, 6 and 4½ sq. ft. to lb. ton		*$18.00*
Red Rope Roofing, 250 sq. ft. per roll		*$1.75*

Tarred Paper—
1 ply (roll 300 sq. ft.), ton.....$32.50@35.50
2 ply, roll 192 sq. ft.....55¢
3 ply, roll 108 sq. ft.....75¢
Slater's Felt (roll 500 sq. ft.).70¢

Sand and Emery—
Flint Paper and Cloth..50&10@60%
Garnet Paper and Cloth....25%
Emery Paper and Cl'h..50&10@60%

Parers— Apple—
Advance.....℔ doz. $4.00
Baldwin.....℔ doz. $4.00
Bonanza Improved.....each $6.50
Daisy.....℔ doz. $4.00
Dandy.....each $7.50
Eureka Improved.....each $20.00
Family Bay State.....℔ doz. $15.00
Improved Bay State.....℔ doz. $36.00
Little Star.....℔ doz. $5.00
New Lightning.....℔ doz. $7.00
Reading 72.....℔ doz. $3.25

Reading 78.....⅌ doz. $6.22
Rocking Table.....⅌ doz. $6.20
Turn Table '98.....⅌ doz. $6.00
White Mountain.....⅌ doz. $5.09

Potato—
Saratoga.....⅌ doz. $7.00
White Mountain.....⅌ doz. $6.00

Picks and Mattocks—
List Feb. 23, 1899.....75%
Cronk's Handled Garden Mattock, ⅌ doz., $6.40.....33⅓%

Pinking Irons—
See *Irons, Pinking.*

Pins, Escutcheon—
Brass.....60@60&10%
Iron, list Nov. 11, '85..60@60&10%

Pipe, Cast Iron Soil—
Carload lots.
*Standard, 2-6 in.*50&10@50&10&5%
Extra Heavy, 2-6 in......65&10%
Fittings.....70&10@70&10&5%

Pipe, Merchant—
Consumers, Carloads.

	Steel. Blk.	Galv.	*Iron.* Blk.	Galv.
⅛ & ¼ in.	71%	55%	68%	52%
⅜ in.	73½	59%	70½	56%
½ in.	75%	63%	72½	60%
¾ to 6 in.	79%	69%	76½%	66½%
7 to 12 in.	74%	59%	71½%	56%

Pipe, Vitrified Sewer—
Carload lots.
Standard Pipe and Fittings, 2 to 24 in.:
New England.....68%
New York and New Jersey.71½
*Maryland, Delaware, E. Pa.*73½
West. Pa. and West Va.....75%
Virginia.....76%
Ohio, Michigan and Ky.....75%
Indiana.....77½
NOTE.—Carload lots are generally delivered.

Pipe, Stove—

Edwards' Nested:	C. L.	L. C. L.
5 in., per 100 joints	$7.00	$8.00
6 in., per 100 joints	7.50	8.50
7 in., per 100 joints	8.50	9.50

Planes and Plane Irons—
Wood Planes—
Bench, first qual......40&10%
Bench, Second qual......50&10%
Molding.....33⅓&10%
Bailey's (Stanley R. & L. Co.).....40%
Chapin-Stephens Co.:
Bench, First Quality.....40@40&10%
Bench, Second Quality....50@50&10%
Molding.....33⅓@33⅓&10%
Toy and German.....40@40&10%
Chaplin's.....60%
Ohio Tool Co.:
Bench, First Quality.....40@40&10%
Bench, Second Quality....50@50&10%
Molding.....33⅓@33⅓&10%
Adjustable Wood Bottom.....60%
Unicn.....60%
Iron Planes—
Bailey's (Stanley R. & L. Co.).....40%
Chaplin's Iron Planes.....50&10%
Miscellaneous Planes (Stanley R. & L. Co.).....35%
Ohio Tool Co.'s Iron Planes.....60%
Sargent's.....60&10%
Union.....60%
Plane Irons—
Wood Bench Plane Irons.....
25&10@30%
Buck Bros.....30%
Chapin-Stephens Co.....30@30&10%
Ohio Tool Co.....30%
Stanley R. & L. Co.....35%
Union.....50%
L. & I. J. White.....20&5@25%

Planters, Corn, Hand—
Kohler's Eclipse.....⅌ doz. $8.50

Plates—
Felloe.....*lb. 4@4¼¢*
Self-Sealing Pie Plates (R. M. Co.). ⅌ doz. $2.00.....50%

Pliers and Nippers—
Button Pliers....75&10@75, 10, 5%
Gas Burner, per doz., 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.
Gas Pipe., 7 8 10 12-in.
$2.00 $2.25 $3.00 $3.75
Acme Nippers.....50&5%
Cronk & Carrier Mfg. Co.:
American Button.....75&10%
Cronk's.....60%
Stub's Pattern.....50%
Combination and others.....33⅓%
Heller's Farriers' Nippers, Pincers and Tools.....40&10@40&10&10%
The Nettleton Mfg. Co. Reversible Cutting Nippers.....40%
P., S. & W. Tinners' Cutting Nippers.....40%
Wm. Schollhorn Co.:
Bernard.....33⅓%
Elm City.....33⅓%
Lodi.....50%
Paragon.....50%
Swedish Side, End and Diagonal Cutting Pliers.....50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds.....40%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels.....30@30&10&10%
Chapin's Imp. Brass Cor.40@40&10&10%
Pocket Levels.....30@30&10&10%
Disston's Plumbs and Levels.....70%
Disston's Pocket Levels.....73%
C. E. Jennings & Co.'s Iron.....33⅓%
C. E. Jennings & Co.'s Iron, Adjustable.....40&7½%
Stanley R. & L. Co.....60%
Stanley's Duplex.....38%
Woods' Extension.....33⅓%

Poachers, Egg—
Buffalo Steam Egg Poachers, ⅌ doz., No. 1, $6.00; No. 2, $8.00; No. 3, $9.00; No. 4, $12.00.....50%

Points, Glaziers'—
Bulk and 1-lb. papers,.....*lb. 10¢*
½-lb. papers.....*lb. 9@10½¢*
¼-lb. papers.....*lb. 9¾@11¢*

Pokes, Animal—
Ft. Madison Hawkeye.....⅌ doz. $3.25
Ft. Madison Western.....⅌ doz. $4.00

Police Goods—
Manufacturers' Lists...25@25&5%
Tower's.....25%

Polish—Metal, Etc—
Glasbrite, No. 2, 5 lb can (powder), each, $1.25; ⅌ doz., $12.00; No. 2, 10 lb can (cake), each, $2.50; ⅌ doz., $24.00.
Prestoline Liquid, No. 1 (½ pt.), ⅌ doz., $3.00; No. 2 (1 qu.), $9.72.....40%
Prestoline Paste.....40%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ⅌ doz. 50¢; ⅌ gro. $4.50; ½ lb boxes, ⅌ doz. $1.25; 1 lb boxes, ⅌ doz. $2.25.
U. S. Liquid, 8 oz. cans, ⅌ doz., $1.25; ⅌ gro., $12.00.
Barkeepers' Friend Metal Polish, ⅌ doz., $1.75; ⅌ gro., $18.00.
Wynn's White Silk, ½ pt. cans, ⅌ doz.....$2.00

Stove—
Black Eagle Benzine Paste, 5 lb cans, ⅌ lb 10¢
Black Eagle, Liquid, ½ pt. cans.. ⅌ doz. 75¢
Black Jack Paste, ¾ lb cans, ⅌ gr. $9.00
Black Kid Paste, 5 lb can....each, $0.65
Ladd's Black Beauty Liquid, per 100 tins.....$4.75
Joseph Dixon's, ⅌ gr. $5.75.....10%
Dixon's Plumbago.....⅌ lb 8¢
Fireside.....⅌ gr. $2.50
Gem, ⅌ gr. $1.50.....10%
Japanese.....⅌ gr. $3.50
Jet Black.....⅌ gr. $3.50
Peerless Iron Enamel, 10 oz. cans.. ⅌ doz. $1.50
Wynn's:
Black Silk, 5 lb pail.....each 70¢
Black Silk, ½ lb box.....⅌ doz. $1.00
Black Silk, 5 oz. box.....⅌ doz. $0.75
Black Silk, ½ pt. liq.....⅌ doz. $1.00

Poppers, Corn—
1 qt., Square.....*gro. $9.00*
1 qt., Round.....*gro. $10.00*
1½ qt., Square.....*gro. $11.00*
2 qt., Square.....*gro. $13.00*

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Posts, Steel—
Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts.....each $1.30

Potato Parers—
See *Parers, Potato.*

Pots, Glue—
Enameled.....40%
Tinned.....35%

Powder—
In Canisters:
Duck, 1 lb.....*each 45¢*
Fine Sporting, 1 lb....*each 75¢*
Rifle, ½-lb.....*each 15¢*
Rifle, 1-lb.....*each 25¢*
In Kegs:
12½-lb. kegs.....*$3.50*
25-lb. kegs.....*$4.50*
King's Semi-Smokeless:
Keg (25 lb bulk).....$6.50
Half Keg (12½ lb bulk).....$3.50
Quarter Keg (6¼ lb bulk).....$1.90
Case 24 (1 lb cans bulk).....$8.50
Half case (1 lb cans bulk).....$4.50
King's Smokeless: Shot Gun. Rifle.
Keg (25 lb bulk).....$12.00 $15.00
Half Keg (12½ lb bulk).. 6.25 7.75
Quarter Keg (6¼ lb bulk). 3.25 4.00
Case 24 (1 lb cans bulk).. 14.00 17.00
Half case 12 (1 lb c. bk).. 7.25 8.75
Robin Hood Sm'less Shot Gun..50&20%

Presses—
Fruit and Jelly—
Enterprise Mfg. Co.....20@25%
Seal Presses—
Morrill's No. 1, ⅌ doz., $20.00.....50%

Pruning Hooks and Shears
See *Shears.*

Pullers, Cork—
Invincible Cork Puller.....$21.00

Pullers, Nail—
Cyclops.....50%
Miller's Falls, No. 3, ⅌ doz., $12.00..33⅓&10%
Morrill's No. 1, Nail Puller, ⅌ doz. $20.00.....50%
Pearson No. 1, Cyclone Spike Puller, each $30.00.....50%
Scranton, Case Lots:
No. 2B (large).....$5.50
No. 3B (small).....$5.00
Smith & Hemenway Co.:
Diamond B, No. 2, case lots..... ⅌ doz. $6.00
Diamond B, No. 3, case lots..... ⅌ doz. $5.50
Giant No. 1, ⅌ doz. $18; No. 2, $16.50; No. 3, $15.....33⅓%
Staple Pullers.....60%
Parrot Tack and Stub Puller, ⅌ doz. 75c.; ⅌ gro., $6.00

Pulleys, Single Wheel—

Inch	1¼	1¾	2	3
Awning or Tackle, doz.	$0.30	.45	.60	1.05

Hay Fork, Swivel or Solid Eye. doz., 4 in., $1.25; 5 in., $1.55

Inch	2	2¼	2½
Hot House, doz.	$0.65	.85	1.20
Inch	1¼	1½	1¾ 2
Screw, doz.	$0.16	.19	.24 .30
Inch	1¾	2	2¼ 2½
Side, doz.	$0.25	.40	.55 .67
Inch	1½	1¾	2 2½

Stowell's:
Ceiling or End, Anti-Friction..60&10%
Dumb Waiter, Anti-Friction..60&10%
Electric Light.....60%
Side, Anti-Friction.....60&13%

Sash Pulleys—
Common Frame; Square or Round End, per doz, 1¾ and 2 in......*16@19¢*
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in..16@19¢
Acme.....1¾ in., 16¢; 2 in., 19¢
Fox-All-Steel, Nos. 3 and 7, 2 in.... ⅌ doz. 50%
Grand Rapids All Steel Noiseless..50%
Ideal.....70&10%
Niagara.....1¾ in., 16¢; 2 in., 19¢
No. 26, Troy..1¾ in., 14½¢; 2 in., 16½¢
Star.....1¾ in., 16¢; 2 in., 19¢
Tackle Blocks—See Blocks.

Pumps—
Cistern.....*60@60&10%*
Pitcher Spout.....*80@80&10%*
Wood Pumps, Tubing, &c..*45@50%*
Barnes Dbl. Acting (low list).....50%
Barnes' Pitcher Spout.....75&10&5%
Contractors' Rubber Diaphragm No. 2, B. & L. Block Co.....$16.00
Daisy Spray Pump.....⅌ doz. $6.75
Flint & Walling's, Fast Mail Hand, (low list).....55%
Flint & Walling's Fast Mail (low list).....55&5%
Flint & Walling's Tight Top Pitcher.80%
National Specialty Mfg. Co., Measuring, $6.00.....30%
Mechanical Sprayer.....$6.00
Myers' Pumps (low list).....50%
Myers' Power Pumps.....50%
Myers' Spray Pumps.....50&10%

Pump Leathers—
Plunger and Lower Valve—Per gro.:

Inch...	2	2¼	2½	2¾
	$2.20	2.50	2.75	3.00
Inch...	3	3¼	3½	3¾ 4
	$3.30	3.60	3.85	4.10 4.40

Plunger Cup Leathers—Per 100:

Inch...	2½	3	3½	4
	$2.75	3.85	5.00	6.00

Punches—
Saddlers' or Drive, good.....
doz. 50@75¢
Spring, single tube, good quality.....*$1.75@2.00*
Revolving (4 tubes).....
doz. $3.50@3.75
Bemis & Call Co.'s Cast St'l Drive.50%
Bemis & Call Co.'s Check.....55%
Morrill's Nos. 1AA, 1A, 1B, 1C, $15.00.....50%
Hercules, 1 die, each $5.00.....50%
Niagara Hollow Punches.....40%
Niagara Solid Punches.....55&10%
Wm. Schollhorn Co.:
Bernard.....33⅓%
Lodi.....50%
Paragon.....50%
Steel Screw, B. & K. Mfg. Co.....50%
Tinners' Hollow, P., S. & W. Co...40%
Tinners' Solid, P., S. & W. Co., ⅌ doz., $1.44.....60%

Rail—Barn Door, &c.—
Sliding Door, Painted Iron.....
2½@2¾¢
Sliding Door, Wrought Brass, 1½ in., lb., 36¢.....*30%*
Allith Mfg. Co.:
No. 1, Reliable Hgr. Track, ⅌ ft. 5½¢
No. 2, Reliable Hgr. Track, ⅌ ft. 7¢
Cronk's:
Double Braced Steel Rail..⅌ ft. 2¾¢
O. N. T. Rail.....2½¢
Griffin's:
xxx, ⅌ 100 ft., 1 x 3-16 in., $3.00; 1¼ x 3-16 in., 3.50.
Hinged Hanger, ⅌ 100 ft., 1 x 3-16 in., $3.10; 1¼ x 3-16 in., $3.60.
Lane's:
Hinged Track, ⅌ 100 ft., 1 in., $3.40; 1¼ in., $4.10.
O. N. T. ⅌ 100 ft., 1 in., $2.75; 1¼ in., $3.50; 1½ in., $4.00.
Standard, 1¼ in.....⅌ 100 ft. $4.00
Lawrence Bros.:
⅌ 100 ft. No. 201, $4.00; No. 202, $4.00
New York, 1 x 3-16 in., ⅌ 100 ft., $2.75
McKinney's:
Hinged Hanger Rail, ⅌ ft., 11¢..50%
None Better.....⅌ ft. 3¾¢
Standard.....⅌ ft. 4¢
Myers' Stayon Track.....60&10%
Richards' Mfg. Co.:
Common, 1 x 3-6 in., $3.00; 1½ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail...60&10%
Lag Screw Rail, No. 65.....50%
Gauge Trolley Track, ⅌ ft., No. 31, 9¢; No. 32, 14¢; No. 33, 20¢.
No. 50.....60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.
Safety Door Hanger Co.'s Storm King Safety.....60%
Safety Door Hanger Co.'s U. S. Standard.....60%
Stowell's:
Cast Rail.....⅌ ft. 1¾¢
Steel Rail, Plain.....22%
Wrought Bracket, 1 3-16 in.....⅌ ft. 3¢
Wrought Bracket, 1½ x 5-16..⅌ ft. 7¢
Swett's Hylo, ⅌ ft. 11¢.....60%
P. L. B. Steel Rail.....⅌ 100 ft. $3.00
No. 0, 1 x 3-16.....⅌ 100 ft. $2.75

Rakes—
NOTE.—Many goods are sold at net prices.
Fort Madison Red Head Lawn....$3.25
Fort Madison Blue Head Lawn....$2.70
Jackson Lawn, 29 and 30 teeth, ⅌ doz., net.....$4.25
Cronk's:
New Champion Garden, ⅌ doz., 12 teeth, $15.00; 14, $16.50; 16, $18.00..75%
Victor Garden, ⅌ doz., 12 teeth, $15.00; 14, $16.50; 16, $18.00.....80%
Queen City Lawn, ⅌ doz., 29 teeth, $3.45; 24, $3.60.....net.
Anticlog Lawn, ⅌ doz.....$4.00
Malleable Garden.....70&10%
Kohler's:
Lawn Queen, 20-tooth.....⅌ doz. $3.45
Lawn Queen, 24-tooth.....⅌ doz. $3.60
Paragon, 20-tooth.....⅌ doz. $2.75
Paragon, 24-tooth:.....⅌ doz. $3.00
Steel Garden, 14-tooth....⅌ doz. $2.40
Malleable Garden, 14-tooth, ⅌ doz. $1.75@2.00
Weldless Steel Garden.....75&5%

Rasps, Horse—
Disston's.....75%
Heller Bros.'.....70&5@70&10&5%
McCaffrey's American St'd...60&10&5%
New Nicholson.....70&10@75%
See also Files.

Razors—
Boras—I C.....60%
Fox Razors, No. 42..⅌ doz. $20.00 } 40% Dis.
Fox Razors, No. 44..⅌ doz. $20.00 } 40% Dis.
Fox Razors, No. 82, Platina.... ⅌ doz. $25.00 } 40% Dis.
Red Devil.....50%
Silberstein:
Carbo Magnetic.....$18.00
Griffon, No. 65.....$15.00
Griffon, No. 00.....$12.00
All other Razors.....40%

Safety Razors—
Kampfe Bros.:
Star Safety.....25%
Star Interchangeable.....25%
Star Safety Corn.....25%
Silberstein.....40%

Reels, Fishing—
Hendryx:
M 6, Q 6, A 6, B 6, M 9¼, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo, Nickeled Populo.....20%
Aluminum, German Silv., Bronze.25%
1240 N, 124 N.....25%
3004 N, 06 N, 6 RM, G 9.....20%
4 N, 6 PN, 24 N, 26 PN.....20%
2904 P.....33⅓%
2904 PN.....33⅓%
0924 N.....33⅓%
02084 N.....33⅓%
002904 PN.....33⅓%
802 N.....33⅓%
986 PN, 2904 N, 974 PN.....25%
5009 PN, 5009 N.....20%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR.....20%
304 P, 304 PN, 00304 P, 00304 PN.33⅓%

Registers—*List July 1, 1903.*
Japanned, Electroplated and Bronzed.....*70&10%*

Revolvers—
Single Action.....*95¢@$1.00*
Double Action, except 44 cal..*$1.85*
Double Action, 44 caliber....*$2.00*
Automatic.....*$3.45*
Hammerless.....*$4.00*

Riddles, Hardware Grade
16 in......*per doz.$2.50@$2.75*
17 in......*per doz.$2.75@$3.00*
18 in......*per doz.$3.00@$3.25*

Rings and Ringers—
Bull Rings—

	2	2½	3 inch.
Steel	$0.70	0.75	0.80 doz.
Copper	$1.00	1.15	1.40 doz.

Rea's Improved Self-Piercing, Copper, 2 in., ⅌ doz., $1.25; 2½ in., $1.50; 3 in., $1.75.
Hog Rings and Ringers—
Hill's Rings, gro. boxes.$4.00@4.50
Hill's Ringers, Gray Iron.....
doz. 50@55¢
Hill's Ringers, Malleable Iron..
doz. 70@75¢
Blair's Rings...*per gro.$4.75@5.25*
Blair's Ringers.per doz. $0.60@ .65
Brown's Rings..*per gro.$5.00@5.50*
Brown's Ringers.per doz.$0.60@ .65

Rivets and Burrs—
Copper.....*45@45&5%*
Iron or Steel.....*75@75&5%*

Bifurcated and Tubular—
Assorted in Boxes.
Bifurcated, per doz. boxes, pasteboard boxes, 23@25¢; Tin boxes, 29@32¢.
Tubular, per doz. boxes, 50 count, 29@32¢; 100 count, 51@58¢.

Rollers—
Acme, Stowell's Anti-Friction.....50%
Barn Door, Sargent's list.....60%
Cronk's Stay No. 53, $0.90; No. 50.....$1.00
Cronk's Brinkerhoff No. 55, $0.60; No. 56.....$0.84
Lane's Stay.....40%
Richards' Stay:
Handy Adj. and Reversible No. 53.75¢
O. K. Adj. and Reversible No. 58.50¢
Lag Screw, Nos. 55 and 57.....50%
Underwriters', Nos. 59, 60.....50%
Favorite, No. 54.....60%
Stowell's Barn Door Stay..⅌ doz. $1.00
Swett's Anti-Friction.....50%
Screw and Spike Stay.....⅌ doz. 65¢
Hinge Adjustable Stay.....⅌ doz. 90¢

Rope—
Manila, 7-16 in. diam. and larger:
Pure.....*lb., 12½¢*
Sisal, 7-16 in. diam. and larger:
Pure.....*lb. 9½¢*
Sisal, 7-16 in. diam. and larger:
No. 2 quality.....*lb., 8¢*
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse:
Mixed.....*lb., 8¢*
Pure.....*lb. 9½¢*
Sisal, Tarred, Medium Lath Yarn, Coarse and Untarred:
Mixed.....*lb. 8¢*
Pure.....*lb. 9½¢*
Cotton Rope:
Best, ¼-in. and larger.16½@18¢
Medium, ¼-in. and larger, 15½@16½¢
Common, ¼-in. and larger..10¢
In coils, ½¢ advance.
Jute Rope:
Thread No. 1, ¼-in. & up..lb.7¢
Thread No. 2, ¼-in. & up.lb.6¼¢
Old Colony Manila Transmission Rope.....⅌ lb 17½¢

Wire Rope—
Galvanized.....*37½&2½%*
Plain.....*45&2½%*

Ropes, Hammock—
Covert Mfg. Co.:
Jute.....45%
Sisal.....33⅓%
Covert Saddlery Works.....60&5%

Rulers, Desk—
Stimpson & Son:
Boxwood and Maple.....30&10%

Rules

Boxwood .....60@10&10%
Ivory .....35&10@35&10&5%
Chapin-Stephens Co.:
Boxwood .....60@60&10%
Flexifold .....27½&10&10&2½%
Ivory .....35@35&10&10%
Miscellaneous .....50@50&10&10%
Combination .....55@55&10%
Stationers' .....10@10&10%
Keuffel & Esser Co.:
Folding, Wood.....35&10%
Folding, Steel.....33⅓&10%
Lufkin's Steel.....50&10%
Lufkin's Lumber.....60%
Stanley R. & L. Co.:
Boxwood 62½%
Ivory 45%
Miscellaneous 60%
Zig Zag.....40%
Zig Zag, Pin Joint.....42½%
Upson Nut Co.:
Boxwood .....60@60&10%
Ivory .....35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*

Sash Locks—
See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins':
Circular 50%
Band .....50&10@60%
Cross Cuts.....35&5%
Mulay, Mill and Drag.....50%
One-Man Saw.....40%
Wood Saws.....40%
Hand, Compass, &c.....40%
Chapin-Stephens Co.:
Turning Saws and Frames..30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws....30&10&10%
Disston's:
Circular, Solid and Ins'ted Tooth.50%
Band, 2 to 14 in. wide.....60%
Band, ¼ to 1¾.....60%
Crosscuts 50%
Narrow Crosscuts.....55%
Mulay, Mill and Drag.....50%
Framed Woodsaws.....35%
Woodsaw Blades.....35%
Woodsaw Rods.....25%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 76, 77, 8.....25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination.....30%
Compass, Key Hole, &c.....25%
Butcher Saws and Blades.....35%
C. E. Jennings & Co.'s:
Back Saws.....25%
Butcher Saws.....30%
Compass and Key Hole Saws..35&5%
Framed Wood Saws.....30%
Hand Saws.....20&2½%
Wood Saw Blades.....35%
Millers Falls:
Butcher Saws.....15&10%
Star Saw Blades.....15&10%
Peace & Richardson's Hand Saws...30%
Simonds':
Circular Saws.....50%
Crescent Ground Cross Cut Saws..35%
One-Man Cross Cuts.....40&10%
Gang Mill, Mulay and Drag Saws.50%
Band Saws.....50%
Back Saws.....25@25&7½%
Butcher Saws.....35@35&7½%
Hand Saws.....25@25&7½%
Hand Saws, Bay State Brand.....45%
Compass, Key Hole, &c..25@25&7½%
Wood Saws.....35@35&7½%
Springfield Mach. Screw Co.:
Diamond Kitchen Saws....40&10@50%
Butcher Saws Blades.....35@40%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws.....50%

Hack Saws—

Atkins' Hack Saw Blades A A A..35%
Disston's:
Concave Blades.....25%
Keystone 40%
Hack Saw Frames.....30%
Fitchburg File Works, The Best...35%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180.....40&7½%
Hack Saws, Nos. 175, 180, complete, 40&7½%
Goodell's Hack Saw Blades.....40%
Griffin's Hack Saw Frames..35&5&10%
Griffin's Hack Saw Blades..35&5&10%
Springfield Mach. Screw Co.:
Diamond Hack Saw Blades.....35%
Diamond Hack Saw Frames.....50%
Star Hack Saws and Blades.....15&10%
Sterling Hack Saw Blades....30&10&5%
Sterling Hack Saw Frames...30&10&10%
Sterling Power Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00..10%
Victor Hack Saw Blades.....25%
Victor Hack Saw Frames.....40%

Scroll—

Barnes' No. 7, $15.....25%
Barnes' Scroll Saw Blades.....40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20.....20%
Lester, complete, $10.00.....15&10%
Rogers, complete, $4.00.....15&10%

Scalers, Fish—

Covert's Saddlery Works.....60&10%

Scales—

Family, Turnbull's....50@50&10%
Counter:
Hatch, Platform, ½ oz. to ¼ lbs. .....doz. $5.50
Two Platforms, ½ oz. to 8 lbs. .....doz. $16.00
Union Platform, Plain.$1.70@1.90
Union Platform, Stpd.$1.85@2.15
Chatillon's:
Eureka 25%
Favorite 40%
Crocers' Trip Scales.....50%
Chicago Scale Co.:
The "Little Detective"....25 lbs 50%
Union or Family No. 2.....60%
Portable Platform (reduced list)..50%
Wagon or Steck (reduced list).25@35%
"The Standard" Portables.....50%
"The Standard" R. R. and Wagon.50%

Scrapers—

Box, 1 Handle.....doz. $2.00@2.25
Box, 2 Handle.....doz. $2.60@2.85
Ship....Light, $2.00; Heavy, $4.50
Adjustable Box Scraper (S. R. & L. Co.), $6.00.....45%
Chapin-Stephens Co., Box.....30@30&10&10%

Screens, Window and Frames—

Maine Screen Frames.....40&10&5%
See also *Doors.*

Screws—Bench and Hand

Bench, Iron, doz., 1 in., $2.50@2.75; 1⅛, $3.00@3.25; 1¼, $3.50@3.75
Bench, W'd, Beech.doz. 30@30&5%
Hand, Wood.....30@30&5%
R. Bliss Mfg. Co., Hand....30@30&10%
Chapin-Stephens Co., Hand..30@30&10%
Ohio Tool Co., Bench and Hand..30%

Coach, Lag and Hand Rail—

Lag, Cone Point, list Oct. 1, '99 .....75&15%
Coach, Gimlet Point, list Oct. 1, '99.....75&10%
Hand Rail, list Jan. 1, '81.... 70&10@75%

Jack Screws—

Standard List.....80@80&5%
Millers Falls.....50&10&10%
Millers Falls, Roller.....50&10%
P., S. & W.....50%
Sargent .....70&10%
Swett Iron Works.....75&10@80&5%

Machine—

List Jan. 1, '98:
Flat or Round Head, Iron.... 50@50&10%
Flat or Round Head, Brass.... 50@50&10%

Set and Cap—

Set (Iron).....80%
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap.....75%
Hex. Hd. Cap.....75%
Rd. Hd. Cap.....60&10%
Fillister Hd. Cap.....60&10&10%

Wood—

List July 23, 1903.
Flat Head, Iron.....87½&10@..%
Round Head, Iron...85 &10@..%
Flat Head, Brass....85 &10@..%
Round Head, Brass..80 &10@..%
Flat Head, Bronze...77½&10@..%
Round Head, Bronze.75 &10@..%
Drive Screws.....87½&10%

Scroll Saws—

See *Saws, Scroll.*

Scythes—

	Per doz.
Grass, No. 1, Plain	$6.25@6.75
Clipper, Bronzed Webb	$6.50@7.00
No. 3 Clipper, Pol'd Webb	$6.75@7.25
No. 6 Clipper and Solid Steel,	$7.00@7.50
Bush, Weed and Bramble, No. 2	$6.50@7.00
Grain, No. 1	$8.25@8.75
Bronzed Webb, No. 1	$8.50@9.00
Nos. 3 and 4 Clipper, Grain	$8.75@9.25
Solid Steel, No. 6	$9.25@9.75

Seeders, Raisin—

Enterprise .....25@30%

Sets—Awl and Tool—

Aiken's Sets, Awl and Tools:
No. 20, ℔ doz., $10.00.....60&10%
Fray's Adj. Tool Handles, Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7.....50%
C. E. Jennings & Co.'s Model Tool Holders 30%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18....15&10%

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel.....℔ doz sets $9.00

Sets, Nail—

Octagon .....gro. $3.50@3.75
Buck Bros.....27½%
Cannon's Diamond Point, ℔ gro.$12.40%
Mayhew's .....℔ gro. $9.00
Snell's Cor'gated, Cup Pt...℔ gro. $7.20
Snell's Knurled, Cup Pt....℔ gro. $7.20
Springfield Mach. Screw Co.:
Diamond Knurled Cup Pt. ℔ gro. $7.50

Rivet—

Regular list.....75@75&10%

Saw—

Aiken's:
Genuine .....50&10%
Imitation .....50&10%
Atkin's:
Criterion 40%
Adjustable 40%
Bemis & Call Co.'s:
Cross Cut.....30%
Plate 20%
Disston's Star and Monarch.....25%
Morrill's No. 1, $15.00.....50%
Nos. 3 and 4, Cross Cut, $20.00...50%
No. 5, Mill, $30.00.....50%
Nos. 10, 11, 95, $15.60.....50%
No. 1 Old Style, $10.00.....50%
Special, $16.25.....50%
Giant Royal Cross Cut.....℔ doz. $8.00
Royal, Hand.....℔ doz. $4.50
Taintor Positive.....℔ doz. $6.75

Shaving—

Fox Shaving Sets, No. 30 .....℔ doz., net, $24.00
Smith & Hemenway Co.'s.....60%

Sharpeners, Knife—

Chicago Wheel & Mfg. Co.....70%
Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ℔ doz.....$1.50
Mounted Kitchen Sand Stone, ℔ doz.....$1.50
Natural Grit Carving Knife Hones, ℔ doz.....$3.00
Quick Cut Emery Carving Knife Hones, ℔ doz.....$1.50
Quick Edge Pocket Knife Hones, ℔ doz.....$2.50

Skate—

Smith & Hemenway Co.....20%

Shaves, Spoke—

Iron .....doz. $1.10@1.25
Wood .....doz. $1.75@2.25
Bailey's (Stanley R. & L. Co.).....45%
Razor Edge (Stanley R. & L. Co.)..35%
Chapin-Stephens Co.....30@30&10&10%
Goodell's, ℔ doz. $9.00.....15&10%
Wood's F1 and F2.....50%

Shears—

Cast Iron..	7	8	9 in.
Best	$16.00	18.00	20.00 gro.
Good	$13.00	15.00	17.00 gro.
Cheap	.. $5.00	6.00	7.00 gro.

Straight Trimmers, &c.:
Best quality Jap....70@70&10%
Best quality, Nickel..60@60&10%
Fair quality, Jap....80@80&5%
Fail quality, Nickel..75@7..&10%
Tailors' Shears.....40@40&10%
Acme Cast Shears.....40@40&5%
Heinisch's Tailor's Shears.....10%
Wilkinson's Sheep, 1900 list, 30&10&5%; Grass, 50&10%; Horse or Mule, 50&10%

Tinners' Snips—

Steel Blades.....20&5@20&10%
Steel Laid Blades.....40&10@50%
Forged Handles, Steel Blades, Berlin, 50@50&5%
Heinisch's Snips.....40%
Jennings & Griffin Mfg. Co.'s, 6½ to 10 in.....50%
Niagara Snips.....40%
P., S. & W. Forged Handles.....20%

Pruning Shears—

Cronk's Hand Shears.....33⅓%
Cronk's Wood Handle Shears.....33⅓%
Disston's Combined Pruning Hook and Saw, ℔ doz. $18.00.....25%
Disston's Pruning Hook, ℔ doz. $12.00 .....25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades....50&10%
P., S. & W. Co.....33⅓%
Wilkinson's Hedge, Wilcut Brand, 60&10%
Wilkinson's Lawn and Border, Wilcut Brand.....60&10%

Sheaves—Sliding Door—

Stowell's Anti-Friction.....50%
Patent Roller, Hatfield's, Sargent's list .....70&10%
Reading 40%
R. & E. list.....33⅓%
Wrightsville Hatfield Pattern.....80%

Sliding Shutter—

Reading list.....40%
R. & E. list.....33⅓%
Sargent's list.....10&10%

Shells—Shells, Empty—

Brass Shells, Empty:
Climax, Club, Rival, 10 and 12 gauge .....65&5%
Paper Shells, Empty:
Acme, Ideal, Leader, New Rapid, Magic, 10, 12, 16 and 20 gauge..25&5%
Blue Rival, New Climax, Challenge, Monarch, Defiance, Repeater, Yellow Rival, 10, 12, 16 and 20 gauge 20%
Climax, Union, League, New Rival, 10 and 12 gauge.....25%
Climax, Union, League, New Rival, 14, 16 and 20 gauge.....20%
Expert, Metal Lined and Pigeon, 10, 12, 16 and 20 gauge.....33⅓
Robin Hood, Low Brass.....20&5%
Robin Hood, High Brass.....30&5%

Shells, Loaded—

Loaded with Black Powder..40%
Loaded with Smokeless Powder, medium grade.....40&5%
Loaded with Smokeless Powder, high grade.....40&10&10%
Robin Hood Smokeless Powder:
Robin Hood, Low Brass.....50%
Comets, High Brass.....50&10&5%

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:
Iron .....per keg $4.00
Steel .....per keg $3.75
Burden's, all sizes.....℔ keg $3.90

Shot—

Drop, up to B, 25-lb. bag....$1.85
Drop, B and larger .....per 25-lb. bag, $2.10
Buck, 25-lb. bag.....$2.10
Chilled, 25-lb. bag.....$2.10
Dust, 25-lb. bag.....$2.30

Shovels and Spades—

Association List, Nov. 15, 1902..40%

Snow Shovels—

Long Handle.....$2.75@$3.00
Wood and Mall. D. Handle. $3.25@$3.50

Sieves and Sifters—

Hunter's Imitation..... gro. $9.50@10.00
Hunter's Genuine..... per gro. $12.00@12.50

Buffalo Metallic Blued, R. M. Co., ℔ gr.

14&16	16&18	18&20
$13.20	$13.50	$14.40

Shaker (Barler's Pat.) Flour Sifters, ℔ doz., $2.00.....20%

Sieves, Seamless Metallic

Per dozen.

Mesh	14	16	18	20
Iron Wire	$1.05	1.05	1.10	1.20
Tinned Wire	$1.15	1.15	1.20	1.30

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested....doz. $0.90@0.95
Mesh 20, Nested....doz. $1.00@1.05
Mesh 24, Nested....doz. $1.30@1.40

Sinks, Cast Iron—

Painted, Standard list:
12 x 12 to 22 x 36 in....60&5%
20 x 40 to 24 x 50 in.....55%
24 x 60 to 24 x 120 in.....35%
Barnes' low list:
Up to and including 20 x 36 in....60%
20 x 40 to 24 x 50 in.....55%
NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—

Cast Iron.....80@80&10%
Steel .....40@40&10%

Slates, School—

Factory Shipments.
"D" Slates.....50@50&10%
Eureka, Unexcelled Noiseless.. 60&5 tens
Victor A, Noiseless.60&5 tens &5%

Slaw Cutters—See *Cutters.*

Snaps, Harness—

German .....40@40&10%
Covert Mfg. Co.:
Derby .....30&2%
High Grade.....45%
Jockey 35%
Trojan 45%
Yankee .....30&2%
Yankee Roller.....30&2%
Covert's Saddlery Works:
Crown 60%
German 60%
Modei 60%
Triumph 60%
Oneida Community:
Harness Snaps, 1 inch.....60&5%
Swivel Snaps.....60%
Swivels 50%
Sargent's Patent Guarded....66⅔&10%

Snaths—

Scythe 50%

Snips, Tinners—See *Shears.*

Spoons and Forks—

Silver Plated—

Good Quality.....50&10@60&5%
Cheap .....60@60&10%
International Silver Co.:
1847 Rogers Bros. and Rogers & Hamilton .....40&10%
Rogers & Bro., William Rogers' Eagle Brand.....50&10%
Anchor, Rogers Brand.....60%
Wm. Rogers & Son.....60&10%

Miscellaneous—

German Silver.....60@60&5%
Cattaraugus Cutlery Co.:
Seneca Silver.....50%

Tinned Iron—

Teas .....per gro. 45@50¢
Tables.....per gro. $0.50@$1.00

Springs—Door—

Chicago (Coil).....40&10%
Gem (Coil).....20%
Pullman (Coil).....25%
Reliance (Coil).....40&10%
Star (Coil).....30%
Torrey's Rod, 39 in.....℔ doz. $1.10
Victor (Coil).....50&10&10%

Carriage, Wagon, &c.—

1¼ in. and Wider: Per lb
Black .....4@4¼¢
Half Bright.....4@4¼¢
Bright .....4½@4¾¢
Painted Seat Springs:
1½ x 2 x 26.....per pr. 42¢
1½ x 3 x 28.....per pr. 70¢

Sprinklers, Lawn—

Enterprise .....25@30%
Philadelphia No. 1, ℔ doz. $12; No. 2, $15; No. 3, $24.....30%
Pleuger & Henger Mfg. Co.:
Cactus 70%
Japanese 75%
Nationals 65%

Squares—

Nickel plated.. } *List Jan. 5, 1900.*
Steel and Iron. } *75&10@75&10&5%*
Rosewood Hdl. Try Square and T-Bevels .....60&10&10@70%
Iron Hdl. Try Squares and T-Bevels .....40&10@40&10&10%
Disston's Try Sq. and T-Bevels....70%
Winterbottom's Try and Miter, No. 1, 40%; No. 2.....50%

Squeezers, Lemon

Wood, Common, gro., No. 0, $5.25@$5.50; No. 1, $6.25@$6.50.
Wood, Porcelain Lined:
Cheap .....doz. $1.00
Good Grade.....doz. $1.25
Tinned Iron.....doz. $0.75@1.25
Iron, Porcelain Lined...doz. $1.75

Staples—

Barbed Blind.....lb. 6@6½¢
Electricians', Association list.. 80&10&10&10%
Fence Staples, Plain, $2.25; Galvanized $2.55
Poultry Netting Staples..... per lb. 3¼@3½¢
Grand Crossing Tack Co.'s list..80&10%

Steels, Butchers'—

Dick's 30%
Foster Bros.....30%
C. & A. Hoffmann's.....40%

Steelyards—....30@30&10%

Stocks and Dies—

Blacksmiths' .....50@50&10%
Curtis Rev'ble Ratchet Die Stock..25%
Derby Screw Plates.....25%
Green River.....25%
Lightning Screw Plate.....25%
Little Giant.....25%
Reece's New Screw Plates.....25%

Stoners, Cherry—

Enterprise .....25@30%

Stones—Oil, &c.

Chicago Wheel & Mfg. Co., 1904 list:
Gem Corundum Oil, Double Grit.60%
Gem Corundum Axe, Single or Double Grit.....60%
Gem Corundum Slips.....60%
Gem Corundum Razor Hones.....50%
Pike Mfg. Co., 1904 list: ℔ lb.
Arkansas St. No. 1, 3 to 5½ in.$2.90
Arkansas St. No. 1, 5½ to 8 in.$3.50
Arkansas Slips No. 1.....$4.00
Lily White Washita, 4 to 8 in.60¢
Rosy Red Washita, 4 to 8 in..60¢
Washita St., Extra, 4 to 8 in.50¢
Washita St., No. 1, 4 to 8 in.40¢
Washita St., No. 2, 4 to 8 in..30¢
Lily White Slips.....90¢
Rosy Red Slips.....90¢
Washita Slips, Extra.....80¢
Washita Slips, No. 1.....70¢
Washita Slips, No. 2.....40¢
India Oil Stones (entire list)....33⅓%
Quickcut Emery and Corundum Oil Stone, Double Grit.....33⅓%
Quickcut Emery and Corundum Axe Stone, Double Grit.....33⅓%
Quickcut Emery Rubbing Bricks.33⅓%

Hindostan No. 1, R'g'lar, ₩ lb 8¢
Hindostan No. 1, Small, ₩ lb 10¢
Axe Stones (all kinds)
Turkey Oil Stones, Extra, 5 to 8 in., ₩ lb 80¢
Queer Creek Stones, 4 to 8 in., 20¢
Queer Creek Slips, 40¢
Sand Stone, 6¢
} 33⅓%

Scythe Stones—

Chicago Wheel & Mfg. Co.:
Gem Corundum, 10 in., $8.00 ₩ gro., 12 in., $10.80.
Norton Emery Scythe Stones:
Less than gross lots, ₩ gro. $9.00
One gross or more, ₩ gro. $7.20
Lots of 10 gross or more, ₩ gro. $6.00
Pike Mfg. Co., 1901 list:
Black Diamond S. S., ₩ gro. $12.00
Lamoille S. S., ₩ gro. $11.00
White Mountain S. S., ₩ gro. $9.00
Green Mountain S. S., ₩ gro. $6.00
Extra Indian Pond S. S., ₩ gro. $7.50
No. 1 Indian Pond S. S., ₩ gro. $7.00
No. 2 Indian Pond S. S., ₩ gro. $4.50
Leader Red End S. S., ₩ gro. $4.50
Quick Cut Emery, ₩ gro. $10.00
Pure Corundum, ₩ gro. $18.00
Crescent, $7.00
Emery Scythe Rifles, 2 Coat, $8
Emery Scythe Rifles, 3 Coat, $10
Emery Scythe Rifles, 4 Coat, $12
Balance of 1904 list 33⅓%
} 25&5%

Stoppers, Bottle—

Victor Bottle Stoppers, ₩ gro. $9.00

Stops—Bench—

Millers Falls, 15&10%
Morrill's, ₩ doz., No. 1, $10.00, 50%
Morrill's, No. 2, $12.50, 50%

Door—

Chapin-Stephens Co., 60@60&10%

Plane—

Chapin-Stephens Co., 20%

Straps—Box—

Cary's Universal, case lots, 25&20%

Hame—

Covert's Saddlery Works, 60&10%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 60@60&10%
Socket, doz. $1.60
Bullard, ₩ doz., $4.00
Excelsior Stretcher and Tack Hammer Combined, ₩ doz. $6.00, 20%

Strops, Razor—

Star Diagonal Strop, 25%

Stuffers, Sausage—

Enterprise Mfg. Co., 25@25&7½%
National Specialty Co., list Jan. 1, 1902, 30&5%

Sweepers, Carpet—

National Sweeper Co.: ₩ doz.
Louis XV, Roller Bearing, Gold Plated, $120.00
Hepplewhite, Roller Bearing, Silver Plated, $72.00
Sheraton, Roller Bearing, N'kel, $60.00
Ye Mission, Roller Bearing, Oxidized Coppered, $36.00
Transparent, Roller Bearing, Plate Glass top, Nickeled, $36.00
National Queen, Roller Bearing, Fancy Veneers, $27.00
Loyal, Roller Bearing, Veneers, Nickeled, $25.00
Triple Medal, Roller Bearing, Nickeled, $24.00
Marion, Roller Bearing, N'kel, $24.00
Marion Queen, Roller Bearing, Nickeled, $21.00
Monarch, Roller Bearing, N'kel, $22.00
Monarch, Roller Bearing, Jap., $20.00
Perpetual, Regular B'r'gs, N'kel, $20.00
Perpetual, Regular B'r'gs, Jap., $18.00
Monarch Extra (17 in. case), Roller Bearing, Nickeled, $36.00
Monarch Extra (17 in. case), Roller Bearing, Japanned, $33.00
Auditorium (26 in. case), Roller Bearing, Nickeled, $54.00
Mammoth (30 in. case), Roller Bearing, Nickeled, $60.00

NOTE.—Rebates: 50c per dozen on three-dozen lots; $1 per dozen on five-dozen lots; $2 per dozen on ten-dozen lots; $2.50 per dozen on twenty-five-dozen lots.

Streator Metal Stamping Co.:
Model E, Sanitaire, ₩ doz $25.00
Model A, Sterling, ₩ doz. $25.00
Model B, Sterling, Nickeled, ₩ doz. $23.00
Model B, Sterling, Japanned, ₩ doz. $21.00
Model C, Sterling, ₩ doz. $21.50
Model D, Sterling, ₩ doz. $19.50

Tacks, Finishing Nails, &c.

New List, May 1, 1905.

American Carpet Tacks	90&10@— %
American Cut Tacks	90&10@— %
Swedes Cut Tacks	90&10@— %
Swedes Upholsterers'	90&50@— %
Gimp Tacks	90&50@— %
Lace Tacks	90&10@— %
Trimmers' Tacks	90&10@— %
Looking Glass Tacks	65@— %
Bill Posters' and Railroad Tacks	90&50@— %
Hungarian Nails	85@— %
Finishing Nails	70&10@— %
Trunk and Clout Nails	80@— %

NOTE.—The above prices are for Standard Weights. An extra 5% is given on Medium Weights and an extra 10&5% is given on light weights.

Miscellaneous—

Double Pointed Tacks, 90&5 or 6 tens

See also Nails, Wire.

Tanks, Oil—

	Each.
Emerald, R. M. Co.	30-gal. $3.40
Emerald, R. M. Co.	60-gal. $4.25
Queen City, R. M. Co.	30-gal. $3.65
Queen City, R. M. Co.	60-gal. $4.50

Tapes, Measuring—

American Asses' Skin	50@— %
Patent Leather	25@30&5%
Steel	33 1-3&5%
Chesterman's	25@25&5%
Eddy Asses' Skin	40&10@50%
Eddy Patent Leather	25@30&5%
Eddy Steel	40@40&10%

Keuffel & Esser Co.:
Favorite, Ass Skin, 40&10@50%
Favorite, Duck and Leather, 25&5@25&10%
Metallic and Steel, lower list, 35@35&5%
Pocket, 35@35&5%
Lufkin's:
Asses' Skin, 40&10@50%
Metallic, 30@30&5%
Patent Bend, Leather, 25&5@25&10%
Pocket, 40@40&5%
Steel, 33⅓@35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger, per 100 lbs. $2.75@$3.00

Thermometers—

Tin Case, 80&10@80&10&5%

Ties, Bale—Steel Wire—

Single Loop, 80&2½%
Monitor, Cross Head, &c., 70%

Brick Ties—

Niagara Brick Ties, 25&10%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tips, Safety Pole—

Covert's Saddlery Works, 60&10%

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White, 20@20&5%

Hay—

Myers' Hay Tools, 50%
Stowell's Hay Carriers, 50%
Stowell's Hay Forks, 50%
Stowell's Fork Pulleys, 50%

Miniature—

Smith & Hemenway Co.'s, 25%

Saw—

Atkins' Cross Cut Saw Tools, 40%
Simonds' Improved, 33⅓%
Simonds' Crescent, 25%

Ship—

L. & I. J. White, 25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.35; gro. $11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Imitation Oneida, 75@75&5%
Newhouse, 45@45&5%
Hawley & Norton, 65%
Victor, 70&10%
Oneida Community Jump, 50%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 8½@9¢
Mouse, Round or Square Wire, doz. 85@90¢
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, each $1.21; ₩ doz. $13.25
No. 3, Rat, ₩ doz. $6.50; case of 50 $5.75 doz.
No. 3½, Rat, ₩ doz. $5.25; case of 72 ₩ gro. $4.70 doz.
No. 4, Mouse, ₩ doz. $3.25; case of 150 $3.00 doz.
No. 5, Mouse, ₩ doz. $3.00; case of 150 $2.25 doz.

Trimmers, Spoke—

Wood's E I, 50%

Trowels—

Disston Brick and Pointing, 30%
Disston Plastering, 25%
Disston "Standard Brand" and Garden Trowels, 35%
Kohler's Steel Garden Trowels, 5 in. ₩ gro. $4.80
Kohler's Steel Garden Trowels, 6 in. ₩ gro. $6.00
Never-Break Steel Garden Trowels, ₩ gro. $6.00
Rose Brick and Plastering, 25&5%
Woodrough & McParlin, Plastering, 25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern, 50&10%
Western Pattern, 40&10%
Handy Trucks, ₩ doz. $16.00
Grocery, ₩ doz. $15.00
Daisy Stove Trucks, Improved Pattern, ₩ doz. $18.50
McKinney Truck, each $10.00
Model Stove Trucks, ₩ doz. $18.50

Tubs, Wash—*No. 1 2 3*

Galvanized, per doz. $4.25 4.75 5.25
Galvanized Wash Tubs (R. M. Co.):

No.	1	2	3	10	20	30
Per doz., net	$5.70	6.30	7.20	6.60	7.20	8.10

Twine, Miscellaneous—

Flax Twine:	*BC.*	*B.*
No. 9, ¼ and ½-lb. Balls	*22@24¢*	
No. 12, ¼ and ½-lb. Balls	*18@20¢*	
No. 18, ¼ and ½-lb. Balls	*16@18¢*	
No. 24, ¼ and ½-lb. Balls	*16@18¢*	
No. 36, ¼ and ½-lb. Balls	*15@17¢*	
Chalk Line, Cotton ½-lb. Balls	*25@30¢*	
Cotton Mops, 6, 9, 12 and 15 lb. to doz.	*10@18¢*	
Cotton Wrapping, 5 Balls to lb., acording to quality	*11½@20¢*	
American 2-Ply Hemp, ¼ and ½-lb. Balls	*13@14¢*	
American 3-Ply Hemp, 1-lb. Balls	*13@14¢*	
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine)	*9¢*	
India 3-Ply Hemp, 1-lb. Balls	*9¢*	
India 3-Ply Hemp, 1½-lb. Balls	*7½@8½¢*	
2, 3, 4 and 5-Ply Jute, ½-lb. Balls	*9½@10½¢*	
Mason Line, Linen, ½-lb. Bls.	*16¢*	
No. 2½ Mattress, ¼ and ½-lb. Balls	*8¢*	
Wool, 3 to 6 ply	*B 7¢; A 7½¢*	

Vises—

Solid Box, 60%

Parallel—

Athol Machine Co.:
Simpson's Adjustable, 40%
Standard, 40%
Amateur, 25%
Columbian Hdw. Co., 40%
Emmert Universal:
Pattern Makers' No. 1, $15.00; No. 2, $12.50.
Machinist and Tool Makers' No. 4A, $12.50; No. 5A, $7.00; No. 6A, $10.00; No. 10A, $22.50.
Presto Quick Acting, 25@25&5%
Tiger Machinists', 40%
Fisher & Norris Double Screw, 15&10%
Hollands':
Machinists', 40@40&5%
Keystone, 65&5@70%
Lewis Tool Co.:
Adjustable Jaw, 30%
Monarch, 50%
Solid Jaw, 50%
Massey Vise Co.:
Clincher, 40%
Perfect, 20%
Lightning Grip, 20%
Merrill's, 20%
Millers Falls, 60&10%
Parker's:
Victor, 20@25%
Regulars, 20@25%
Vulcan's, 40@45%
Combination Pipe, 55@60%
Prentiss, 20@25%
Sargent's, 40%
Snediker's X. L., 33⅓%
Stephens', 33⅓%
Williamson Mfg Co. Double Swivel, 40&5%

Saw Filers—

Disston's D 3 Clamp and Guide, ₩ doz. $30., 25%
Perfection Saw Clamps, ₩ doz., $4.50
Reading, 60%
Wentworth's Rubber Jaw, Nos. 1, 2 and 3, 45&50%

Wood Workers—

Massey Vise Co.:
Lightning Grip, 15%
Perfect, 15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.50; 14 in., $8.00.

Miscellaneous—

Bignall & Keeler Combination Pipe Vise, 60&10%
Holland's Combination Pipe, 60@60&5%
Massey's Quick Action Pipe, 50%
Parker's Combination Pipe:
87 Series, 60%
187 Series, 60&5%
No. 870, 40%
Williamson Mfg. Co. Double Swivel Combination Pipe, 40&5%

Wads—*Price per M.*

Dis. 15%

B. E., 11 up	60¢
B. E., 9 and 10	70¢
B. E., 8	80¢
B. E., 7	80¢
P. E., 11 up	$1.00
P. E., 9 and 10	1.25
P. E., 8	1.50
P. E., 7	1.50
Ely's B. E., 11 and larger	$1.70@1.75
Ely's P. E., 12 to 20	$3.00@3.25

Ware, Hollow—

Cast Iron, Hollow—

Stove Hollow Ware:
Enameled, 55%
Ground, 60%
Plain or Unground, 65%
Country Hollow Ware, per 100 lbs., $2.75
White Enameled Ware:
Maslin Kettles, 70%
Covered Wares
Tinned and Turned, 40%
Enameled, 50%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware, 60%
Iron Clad Ware, 70&10%
Lava, Enameled, 40&10%
Never Break Enameled, 50%

Tea Kettles—

Galvanized Tea Kettles:

Inch	*6*	*7*	*8*	*9*
Each	*45¢*	*50¢*	*55¢*	*65¢*

Steel Hollow Ware—

Avery Spiders and Griddles, 65@65&5%
Avery Kettles, 60%
Porcelained, 50&5@50&10%
Never Break Spiders and Griddles, 65&5%
Never Break Kettles, 60%
Solid Steel Spiders and Griddles, 65&5%
Solid Steel Kettles, 60%

Warmers, Foot—

Pike Mfg. Co., Soapstone, 40@40&10%

Washboards—

Solid Zinc, ₩ doz.
Crescent, family size, bent frame, $3.25
Red Star, family size, stationary protector, $3.25
Double Zinc Surface:
Saginaw Globe, family size, stationary protector, $2.90
Cable Cross, family size, stationary protector, $3.15
Single Zinc Surface:
Naiad, family size, open back, perforated, $2.65
Saginaw Globe, protector, family size, ventilated back, $2.50
Brass Surface:
Brass King, Single Surface, open back, $3.25
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface, $3.25
Glass Surface:
Glass King, Single Surface, open back, $3.25
Enamel Surface:
Enamel King, Single Surface, ventilated back, $3.25

Washers—Leather, Axle—

Solid, 50&10@50&10&10%
Patent, 90@90&5%
Coil: ¾ 1 1¼ 1½ Inch.
10¢ 11¢ 12¢ 13¢ per box

Iron or Steel—

Size bolt	*5-16*	*⅜*	*½*	*⅝*	*¾*
Washers	*$5.60*	*4.70*	*3.40*	*3.20*	*3.00*

The above prices are based on 5.80¢ off list.

In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots, per lb. 1¾@2¢

Weather Strip—

Flexible Felt—

Lined, per 100 ft., $2; $3; $4, 40&10%
Moore's Unlined, per 100 ft., $2; $3; $4, 50&10%

Wedges—

Oil Finish, lb. 2.70@2.80¢

Weights—Hitching—

Covert Mfg. Co., 40%
Covert's Saddlery Works, 60&10%

Sash—

Per ton, f.o.b. factory:
Eastern District, $27.50@$28.00
Southern Territory, $20.00@$23.00
Western and Central Districts, $23.00@$25.00

Wheels, Well—

8-in., $1.55; 10-in., $2.00; 12-in., $2.50; 14-in., $4.00.

Wire and Wire Goods—

Bright and Annealed:	
6 to 9	80%
10 to 18	80&2½%
19 to 26	80&7½%
27 to 36	80&2½%
Galvanized:	
6 to 9	75&5%
10 to 14	75&7½%
15 to 16	72½&10&2½%
19 to 26	75%
27 to 36	72½%
Coppered:	
6 to 9	75&5%
10 to 14	75&7½%
15 to 18	72½&10&2½%
19 to 26	75&10&5%
27 to 36	75%
Tinned:	
6 to 14	75&10&2½%
15 to 18	75&7½%
Annealed, Steel and Tinned, on Spools	70&10&10@70&10&10&10%
Brass and Copper on Spools	60&5@60&10&5%
Brass, list Feb. 26, '06	15%
Copper, list Feb. 26, '06	25%
Cast Steel Wire	50%
Wire Clothes Line, see Lines.	
Wire Picture Cord, see Cord.	

Bright Wire Goods—

List June 24 '03, 90&20@90&25%
Brass Cup Hooks and Brass Screw Hooks, 85@—%

Wire Cloth and Netting—

Galvanized Wire Netting, 80&5@80&10%
Painted Screen Cloth, 100 ft., $1.00@1.10
Standard Galv. Hardware Grade:
Nos. 2, 2½ & 3 Mesh, sq. ft. 3 ¢
Nos. 4 and 5 Mesh, sq. ft. 3½ ¢
No. 6 Mesh, sq. ft. 3½ ¢
No. 8 Mesh, sq. ft. 4 ¢

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural	75&10&5@80%
Alligator or Crocodile	70&10@75%
Baxter Pattern S Wrenches	70&5@70&10%
Drop Forged S	45@45&5%
Acme	60&10%
Alligator Pattern	70%
Bull Dog	70%
Bemis & Call's:	
Adjustable S	40%
Adjustable S Pipe	40%
Bemis Pipe	60%
Briggs Pattern	40%
Combination Black	40&5%
Combination Bright	40%
Merrick Pattern	50%
Boardman's	40%
Coes' Genuine Knife Hdl.	40&10&5&5%
Coes' Genuine Steel Hdl.	40&10&5&5%
Coes' Genuine Key Model	40&10&5&5%
Coes', Genuine Hammer Handle	40&10&5&5%
Coes' "Mechanics'"	40&10&10&5&5%
Donohue's Engineer	40&10%
Eagle	50&10%
Elgin Wrenches, ₩ doz.	$6.25
Elgin Rethreading Attachment, one die, ₩ doz.	$6.25
Elgin Extra Dies, ₩ doz.	$3.00
Elgin Extra Jaws, ₩ doz.	$1.75
Elgin Monkey Wrench Pipe Jaws, ₩ doz.	$2.10
Gem Pocket	30%
Hercules	70%
W. & B. Machinist:	
Case lots	50&5%
Less than case lots	50%
W. & B. Railroad Special:	
Case lots	50%
Less than case lots	40&10&5%
Solid Handles, P., S. & W.	50&5%
Stillson	65%
Vulcan Chain	50%

Fruit Jar—

Triumph Fruit Jar Wrench, 5 gross lots, ₩ gross, $7.50; ₩ doz., $0.80

Wringers—

Tuttle Roller Press Mop Pail Wringer, each, $8.00; ₩ doz., $48.00

Wrought Goods—

Staples, Hooks, &c., list March 17, '02, 90@90&10%

Yokes, Neck—

Covert Saddlery Works, Trimmed, 70%
Covert Saddlery Works, Neck Yoke Centers, 70%

Yokes, Ox, and Ox Bows—

Fort Madison's Farmers' & Freighters', list net

Zinc—

Sheet, per 100 lbs., $7.90@8.15

For the Table of "Current Metal Prices" see the First Issue of Every Month.